NETWORK WORLD

The Newsweekly of User Networking Strategies

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Software AG airs client/server plan

By Ellen Messmer
Washington Correspondent

RESTON, Va. — Software AG last week announced a distributed computing strategy under which it will migrate its application and programming language products to a client/server architecture over the next 18 months.

The Entire Function Server Technology Series is designed to enable customers to implement data base management and other applications that can access and interact with programs on a variety of hardware and software platforms.

Implementation of Entire will provide an evolutionary bridge from the company's predominately mainframe-based products to heterogeneous client/server environments, which include workstations, minicomputers and mainframes, the company said.

"Software AG has announced to the world that it's trying to shake off the trappings of an old-world data base mainframe firm to remake itself [into] a new-world distributed client/server data base company," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass. "They've laid out something of a

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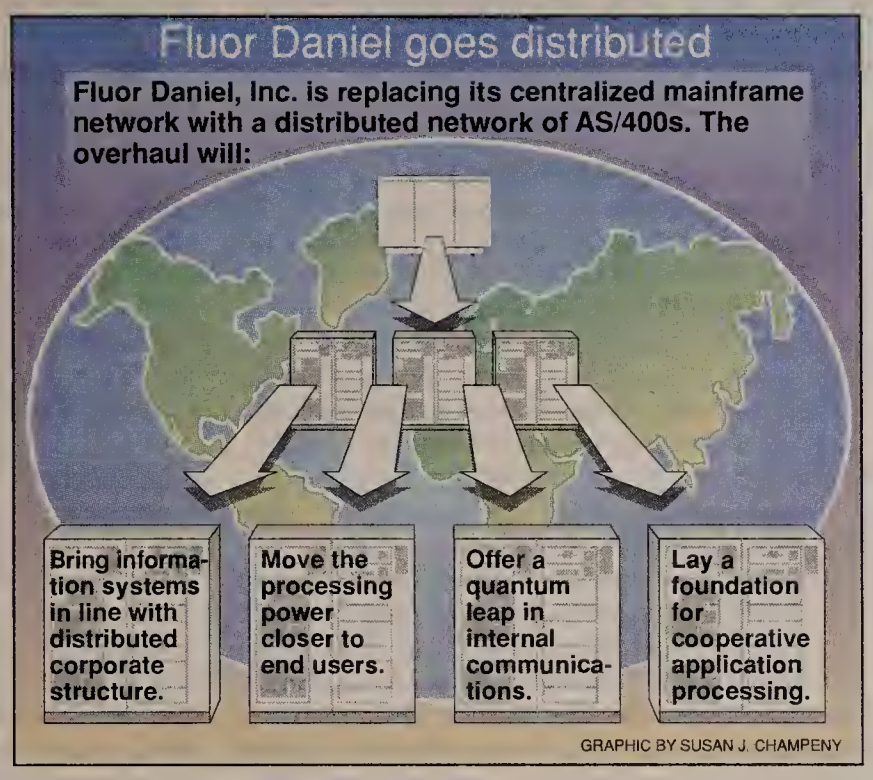

Firm swaps out IBM host for distributed AS/400 net

Fluor Daniel plans to connect 50 minis via APPN.

By Tom Smith
Senior Editor

IRVINE, Calif. — Fluor Daniel, Inc. has begun migrating from a centralized processing architecture based on a single IBM mainframe to a worldwide network based on distributed IBM Application System/400s.

The giant engineering and construction company initially will install AS/400s in its headquarters here to replace an IBM mainframe. But eventually, it expects to install as many as 50 AS/400 minicomputers, linked using IBM's Advanced Peer-to-Peer Networking (APPN), throughout its international net.

The network restructuring will bring Fluor Daniel's information systems (IS) architecture in line with its distributed organizational structure and push processing closer to end users.

"We will be operating data processing so it becomes a mirror image of the company," said Don O'Connor, director of global network at Fluor Daniel, based here. "Data processing has been oper-

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Users rally around mature SNMP wares

Bumper crop of products entices users, but buyers still desire the capabilities of CMIP/CMIS.

By Paul Desmond
Senior Editor

SAN JOSE, Calif. — If last week's INTEROP 90 Conference and Exhibition was any indication, products based on Transmission Control Protocol/Internet Protocol's Simple Network Management Protocol (SNMP) will enjoy a long life in user networks, though not necessarily at the expense of tools based on OSI management protocols.

SNMP took center stage at the show, with a variety of vendors — including Novell, Inc. — rolling out new SNMP-based net management products and more than 40 companies taking part in an SNMP interoperability demonstration on the show floor.

Novell's SNMP software expands net managers' reach. See story, page 65.

In contrast, while 22 vendors participated in the show's Open Systems Interconnection product demonstration, none exhibited wares based on OSI's Common Management Information Protocol (CMIP) for net management.

The INTEROP activity was evidence of the growing popularity of SNMP, which users said is solving problems today that CMIP is still only promising to address. But users are not ruling out using CMIP/Common Management Information Services (CMIS) tools when they do arrive on the market because they realize the OSI

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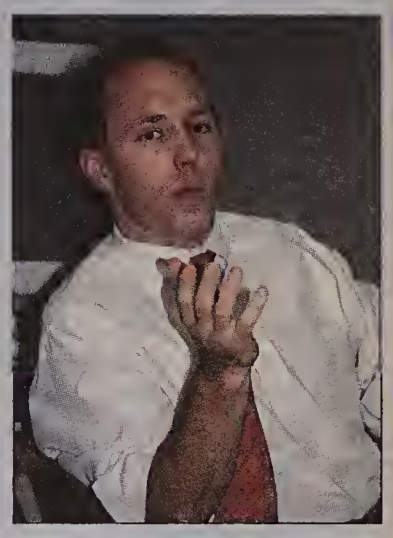

GE exec talks about firm's IBM-to-DEC link, page 2.

Frame relay: Vendors take fast track

Second in a three-part series exploring frame relay technology. The final article will examine frame relay's effect on user networks.

By Bob Brown
Senior Editor

Equipment vendors are rushing frame relay products to market faster than many observers expected, with the major T-1 multiplexer, packet-switch and internetwork equipment vendors saying they will have products ready to debut within the next 18 months.

Manufacturers' ability to respond so quickly is being made possible in large part by a wave of cooperation that has swept over the industry.

For now, vendors have put

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NETLINE

NEWSPAPER

SITA OVERHAULS DATA network to accommodate growth in traffic. Page 2.

CHICAGO BOARD OF TRADE signs up to use Ungermann-Bass hubs at the heart of its trading net. Page 2.

VOLKSWAGEN PLANS to build a nationwide VSAT net to support strategic dealer applications. Page 4.

BANYAN PLEDGES to shift its resources from hardware R&D to VINES software. Page 4.

RETIX AND TOUCH gateways let Novell MHS users exchange E-mail via X.400. Page 4.

EDI MAY CHANGE the face of U.S. Postal Service. Page 38.

VENDORS DEMO MERITS of frame relay services. Page 68.

FEATURE

Users weigh 800 service options, portability

By Daniel Briere
Contributing Editor

So popular that they are nearly ubiquitous, today's 800 services pose far different user choices than they did a few years ago. For one thing, there's more feature competition among vendors. Differences in vendors' features and capabilities, once prevalent, are rapidly diminishing. Sadly, the differences in pricing have also narrowed to within a few percentage points of one another.

New issues loom large. Users are increasingly focusing on network management options, and they are starting to ponder the question of whether to buy intra-local access and transport area 800 service from local or interexchange carriers.

A major concern of users relates to 800 number

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SITA overhauls network to handle traffic growth

Retires Unisys FEPs in favor of Northern Telecom packet switches supporting X.25, high-speed links.

By Jim Brown
Senior Editor

PARIS — Societe Internationale des Telecommunications Aeronautiques (SITA) last week detailed plans to overhaul the international data net it uses to support about 400 member airlines.

The project, which will take four years to complete, calls for the installation of as many as 300 Northern Telecom, Inc. DPN-100 packet switches valued at $50 million. The DPN switches will replace Unisys Corp. Distributed Communications Processor (DCP) front-end processors currently used to route data between remote terminals and various airline hosts.

Construction of the new packet backbone, dubbed the Mega-Transport Network (MTN), was necessitated by dramatic increases in traffic. The older Advanced Network is currently supporting 10 times more traffic than it was designed to handle, and SITA projects traffic will increase 40% a year for at least the next few years.

SITA also had to upgrade its net to accommodate the changing transport needs of member airlines. Air carriers are shifting from proprietary airline protocols, such as Airline Link Control (ALC), to more feature-rich protocols such as X.25 and IBM's

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GE speeds design changes by forging DEC/IBM link

Firm binds applications via LU 6.2 connection.

By Wayne Eckerson
Senior Editor

PLAINVILLE, Conn. — A General Electric Co. unit last week said it has sped delivery of product design changes to factories by forging a peer link between an application on a Digital Equipment Corp. DECnet design network and production software on an IBM minicomputer.

GE's Electrical Distribution and Control (EDC) division, which manufactures circuit breakers and power distribution systems, now disseminates design changes in two or three days to more than 30 factories in the U.S., Mexico and Puerto Rico.

Previously, a forms-based process chewed up almost a week's time before design changes could make it to production floors.

"Shortening the change order cycle means the company can quickly gain the cost savings or improvements in product quality associated with new engineering designs," said Bernard Odoy, development engineer for EDC here. "It also frees our engineers from unnecessary paperwork so they can focus on engineering."

Late last year, EDC implemented the Engineering Documentation and Information System of the Nineties (EDISON), a

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Trade board selects UB's smart hubs for LAN project

By Barton Crockett
Senior Editor

CHICAGO — The Chicago Board of Trade last week announced a multimillion-dollar deal with Ungermann-Bass, Inc. to use the company's Access/One network hubs to build a local-area network that will support critical trading systems the exchange plans to roll out over the next few years.

The 75 Access/One intelligent wiring hubs will connect as many as 2,200 personal computers, terminals and printers on two trading floors to multiple Tandem Computers, Inc. fault-tolerant minicomputers in the Board of Trade's data center here.

The network will use more than 400,000 feet of fiber-optic and unshielded twisted-pair cabling, as well as new software from Ungermann-Bass that enables personal computers to emulate Tandem terminals when communicating with Tandem hosts over Transmission Control Protocol/Internet Protocol links.

The Board of Trade will use the Access/One hubs to support several strategic network applications scheduled to bow over the next three years.

Each of these applications is only in the early test phase but should be implemented by 1993.

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Briefs

AT&T revamps SDDN availability. AT&T has accelerated the scheduled availability of two Software-Defined Data Network (SDDN) capabilities, company executives said at an analyst briefing last week. AT&T initially promised to support 384K bit/sec speeds with SDDN in the first quarter of 1991, but it now says the capability will be available Dec. 1. Also, T-1 SDDN speeds, which were scheduled for third-quarter availability, are now expected to be supported by the middle of next year.

SMDS trialed at INTEROP. Four regional Bell holding companies teamed with AT&T and equipment and software vendors at last week's INTEROP 90 show in San Jose, Calif., to stage what was billed as the first public demonstration of Switched Multimegabit Data Service (SMDS). AT&T, BellSouth Corp., Nynex Corp., Pacific Bell and Southwestern Bell Corp. demonstrated applications such as medical imaging that are well-suited to SMDS, which supports speeds ranging from T-1 to T-3.

Computers supporting the applications were linked to a Pacific Bell central office switch via prototype interface equipment from cisco Systems, Inc., Hewlett-Packard Co., Kentrox Corp. and Sun Microsystems, Inc. From there, links were established over AT&T Accunet T1.5 lines to central offices run by all of the other RBHCs. The demonstration was not a true SMDS implementation because the T-1 links were dedicated, not switched. AT&T said dedicated lines were used because the SMDS interface between interexchange carriers is not yet fully defined.

IBM removes the disk. IBM last week introduced its first diskless local-area network workstation along with a new Ethernet interface for its Micro Channel Architecture bus. The Personal System/2 Model 55 LAN Station (PS/2 Model 55 LS) is a diskless version of the PS/2 Model 55 SX. It comes equipped with a token-ring or Ethernet adapter and 2M bytes of random-access memory, expandable to 16M bytes.

The token-ring model can be downline loaded from an OS/2 Extended Edition Version 1.2-based server running IBM's OS/2 LAN Server Version 1.2 or PC LAN Program Version 1.33; Novell, Inc.'s NetWare 286 or NetWare 386; or Banyan Systems, Inc.'s VINES. The Ethernet version can be downline loaded from a server running NetWare 286, NetWare 386 or VINES.

Configured for a token-ring LAN, the PS/2 Model 55 LS is available immediately for $3,490. An Ethernet version of the workstation costing $2,950, along with the new $575 PS/2 Adapter/A for Ethernet Networks, will be available next month.

OSF announces DCE pricing. The Open Software Foundation (OSF) last week announced pricing for the source code of its Distributed Computing Environment (DCE). Vendors, software developers and users can use the code to build DCE software environments with the intention of simplifying the distribution of applications across networks. An initial source code license, which includes three copies, is priced at $60,000; additional copies cost $5,000. An unlimited source license for a single site sells for $90,000.

OSF will offer object code for DCE as separate components divided into two categories — the DCE Executive and the DCE Services. A single object license fee for the DCE Executive, which includes remote procedure call, basic file service and time service, ranges from $10 to $75. DCE Services, including directory service, security service and advanced file service, are priced separately, but range in price from $250 to $800. Licensees of the DCE Services can receive a discount of as much as 50% for volume shipments.

MCI net management almost here. MCI Communications Corp. last week announced general availability of four of the six applications in its Integrated Network Management Services (INMS): operations management, trouble management, performance and planning management and configuration management. The billing and cost management and order entry and tracking management applications have yet to be made generally available.

Users access the applications over a dedicated link using a stand-alone or networked IBM Personal System/2 outfitted with INMS software. INMS enables customers to monitor, manage and reconfigure their networks. One INMS option is compatible with IBM's NetView network management offering and enables users to link their host computers directly to the MCI INMS host.

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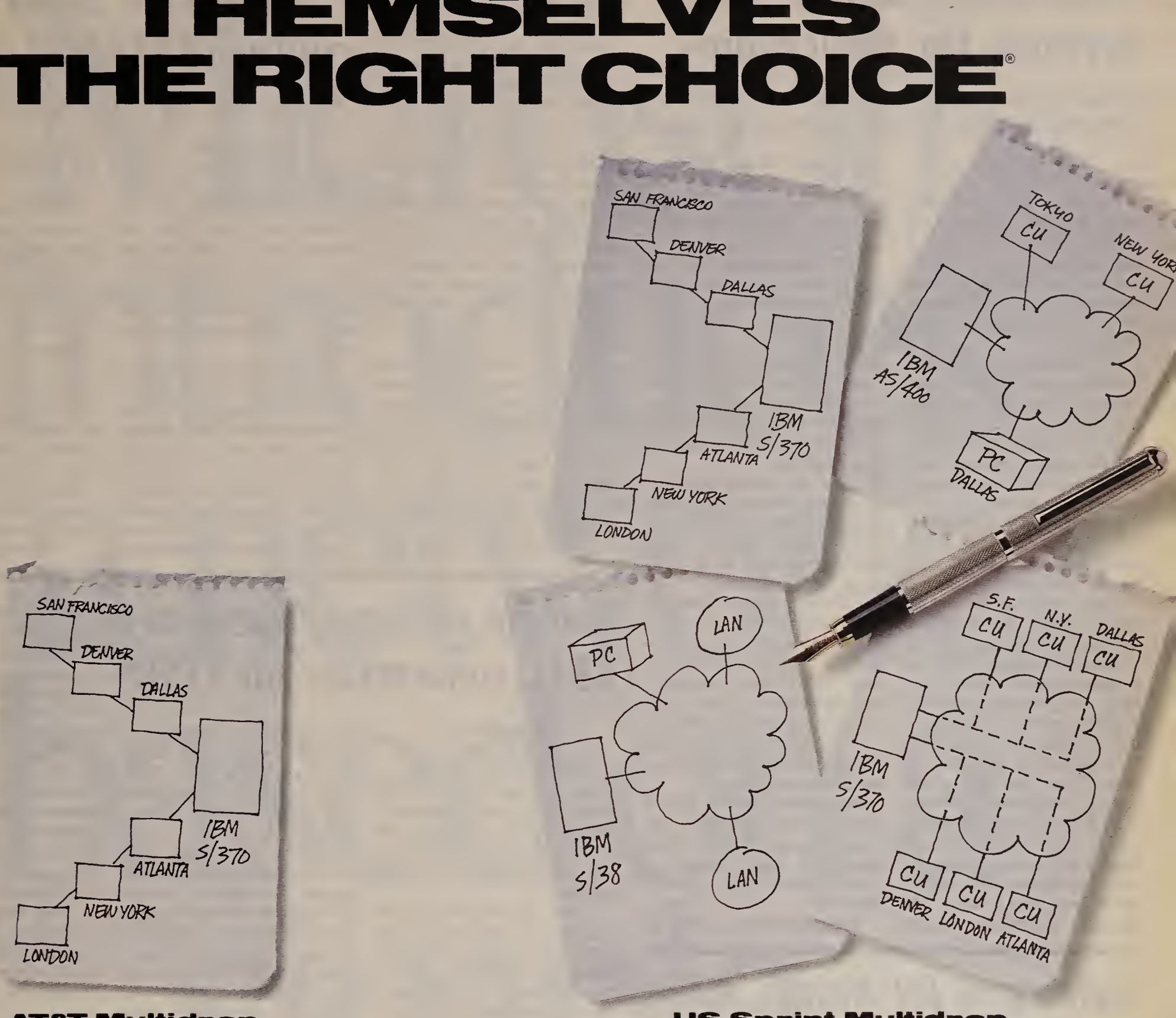

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Volkswagen builds VSAT network for dealerships

Net will offer strategic applications to dealers; company to resell services to other carmakers.

By Jim Brown
Senior Editor

WARREN, Mich. — Volkswagen of America, Inc. last week said it is building a VSAT network that will enable it to roll out strategic applications to 835 dealers nationwide and resell network services to other import car manufacturers.

The network will let dealers order cars, retrieve vehicle warranty and service records, and locate parts via on-line links with different manufacturers' hosts. It will also support one-way video transmissions from various automakers to the dealers.

Volkwagen's V-Crest Systems, Inc. subsidiary is teaming up with Scientific-Atlanta, Inc. to build the very small aperture terminal network, which the two companies will jointly market to other automakers. Volkswagen formed V-Crest last December when the company spun off its dealer computer services division, which had provided support to Volkswagen and Audi dealers for 25 years.

In addition to the VSAT network, V-Crest has built a new suite of applications based on IBM's Advanced Program-to-Program Communications software, which it will use on the net. The APPC applications will support peer-to-peer links between IBM Personal System/2s running IBM's OS/2 Extended Edition software, Application System/400 or System/36 minicomputers at dealer sites and car manufacturers' hosts.

APPC-based applications will enable dealer personnel to retrieve remote host data as if it were stored on the local microcomputer or minicomputer. This makes them easier to use than existing dealer applications, which force users to exit a local application and log on to remote hosts as IBM 3270 terminals in order to access host data.

Previously, dealer personnel were forced to learn two applications and their different commands; the APPC applications require personnel to learn only a single set of commands.

"We always want to provide a common interface to the user," said James Smith, V-Crest's manager of research and development. "But if there is data available somewhere on the network, we want to be able to grab it."

V-Crest will use the net to link Volkswagen and Audi dealers to an IBM mainframe here.

In addition, Porsche Cars of North America, Inc. last week signed up to use V-Crest's net to route data from terminals at Porsche dealers to its AS/400 in Reno, Nev.

Because nearly 80% of Porsche dealers also sell Volkswagens and Audis, those selling all three vehicles will be able to consolidate data traffic on a single network, lowering monthly communications costs. Data is routed from dealerships to a Scientific-Atlanta VSAT hub here. The hub then forwards it over leased lines to the appropriate automaker's host.

The VSAT network replaces a multidrop leased-line network currently used by V-Crest to link Volkswagen and Audi dealers directly to Volkswagen's host at 4.8K bit/sec. It also replaces dial-up lines Porsche uses to link its dealers to its AS/400.

V-Crest's strategy of offering its network to competitors is an attempt to position Volkswagen as a technological leader.

"There is a level of prestige involved in this," Smith said. "The network is going to be one of the keys for the 1990s." Providing a single net for dealers that sell dif-

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Feature-rich SNMP wares capture INTEROP spotlight

Offerings can now control third-party devices.

By Tom Smith
Senior Editor

SAN JOSE, Calif. — For the second straight year, the INTEROP show played host to a bevy of Simple Network Management Protocol (SNMP) product introductions, but this year's crop offered substantially improved functionality over older products.

The INTEROP 90 Conference and Exhibition boasted a 46-vendor SNMP interoperability demonstration; last year's demonstration drew only 25 suppliers. What's more, many of the SNMP products unveiled or exhibited at INTEROP offer expanded capabilities for controlling third-party devices, bringing SNMP closer to realizing its promise as a means for managing multivendor networks.

SNMP's burgeoning popularity has overshadowed the Open Systems Interconnection Common Management Information Protocol (CMIP). In fact, INTEROP attendees seemed so content with SNMP that they questioned whether they would ever need CMIP.

"I don't see myself switching when I'm getting what I want and need today," said Brian Holmes, systems programmer at Wayne State University in Detroit. Wayne State uses SNMP to manage an Ethernet backbone supporting 20 subnets.

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Banyan to forgo hardware R&D, concentrate on VINES

By Bob Brown
Senior Editor

WESTBOROUGH, Mass. — Banyan Systems, Inc. last week said it is cutting back on hardware development in order to dedicate more resources to its VINES local-area network operating system software.

Under the plan, Banyan will transfer most of the research and development dollars from its Hardware Products Group to its software business. It will also hire more software development specialists, while phasing out as many as 40 jobs in its server hardware group over the next eight months.

Banyan will continue to sell and support its existing line of Corporate Network Servers, but future development will focus on add-on products and basic enhancements, said James D'Arezzo, Banyan's vice-president of marketing. Banyan will forgo development of next-generation server hardware, he added.

While de-emphasizing server development, Banyan will expand certification of network hardware from a variety of third-party manufacturers, D'Arezzo said. The company also plans to work closely with third-party software developers to help those firms more quickly bring to market VINES-based applications, including groupware and client/server offerings, he said.

"The bottom line is that we'll be giving VINES customers additional choices in servers and applications," D'Arezzo said. "We'll also be able to bring future VINES developments to market faster."

Larry Stouder, manager of technical development at Continental Grain Co., a New York agribusiness and longtime Banyan user, applauded the news. "They're putting their resources right where we want them to," Stouder said.

D'Arezzo said it makes sense to de-emphasize hardware development given that the company can't compete with hardware specialists in building multiprocessor-based servers, the type of server for which VINES is particularly well-suited.

Banyan entered the server market in the mid-1980s when there were few viable server options for VINES, but recently, a slew of new servers and superservers have flooded the market, he said.

Banyan has already announced strategic partnerships with several key hardware vendors and hopes to sign similar agreements with other vendors in coming months, D'Arezzo said. The company recently announced a joint marketing and development agreement with Compaq Computer Corp., which sells the SystemPro superserver, in conjunction with the shipment of VINES Symmetric Multi-Processing software.

Earlier this year, Banyan instituted a hardware platform certification program to stimulate the qualification of servers based on Intel Corp.'s 80386 and 80486 microprocessors to run VINES. So far, about 40 hardware platforms have been certified as VINES servers, D'Arezzo said.

Banyan executives feel comfortable relying more on other vendors to supply the hardware to support VINES since the privately held company's financial situation is stable enough to do without some server sales revenue, D'Arezzo said.

Industry observers applauded Banyan's move, likening it to Novell, Inc.'s successful strategy of focusing on software and moving out of the hardware business.

"It's the same thing Novell came to grips with," said Craig Burton, chief executive officer at Clarke Burton Corp., a Salt Lake City research firm. "You've got to put your resources where your strengths are."

Doug Gold, director of communications research at International Data Corp., a Framingham, Mass., market research firm, said Banyan would have had difficulty keeping pace with other server vendors. "It's a very competitive market these days in the server business," Gold said, "and while Banyan has a good server product, that clearly is not Banyan's area of strength."

Clarification: While accurate, the story "Timeplex adds ISDN link, upgrades TimeView/2000" (*NW*, Sept. 17) may have led some readers to believe that General DataComm, Inc. uses a proprietary D channel on its Integrated Services Digital Network Primary Rate Interface. The company's PRI interface complies with ISDN standards.

Correction: The story "Hospital to replace minis with microcomputer LANs," (*NW*, Oct. 8) mistakenly said Boston's Brigham and Women's Hospital is implementing the MIIS operating system in its new network. The hospital is migrating from MIIS to a MUMPS-based operating system from DataTree, Inc. in Waltham, Mass.

Gateways let Novell MHS users utilize X.400 E-mail

By Tom Smith
Senior Editor

SAN JOSE, Calif. — Retix and Touch Communications, Inc. last week introduced gateways that enable users of Novell, Inc.'s NetWare Message Handling System (MHS) applications to send and receive electronic mail via X.400.

Both gateways were developed through technology partnerships with Novell, which made the MHS software code available to the two vendors. MHS is a message transfer and routing service that supports communications among applications.

Development of the gateways, which will be sold by Retix and Touch but not by Novell, underscores Novell's commitment to Open Systems Interconnection and the Government OSI Profile, according to Robert Davis, director of product marketing for Novell.

Retix's software, the MHS to X.400 Gateway for DOS, runs on an MHS mail server, translating messages from MHS to X.400 format, which is the OSI messaging standard, said Mark Jung, general manager of the OSI Product Unit for Retix. It can be used with any version of NetWare.

Messages are transmitted over an X.400 network by Retix's existing X.400 Open Server, which runs on a dedicated personal computer running DOS, OS/2 or Unix. The gateway enables users on the NetWare LAN to exchange messages over an X.400 network with other MHS users, as well as users of other systems that support X.400.

Future enhancements

In the future, Retix will provide an upgraded version of OpenServer 400 that will run on a NetWare 386 server as a NetWare Loadable Module, eliminating the need for a dedicated personal computer.

Retix will market its gateway directly to end users and will offer the gateway to vendors of MHS-compliant E-mail systems

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Microsoft introduces a network based on a simple business principle.

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To get ahead in business you need to be well connected. That's why we developed the Microsoft® network.

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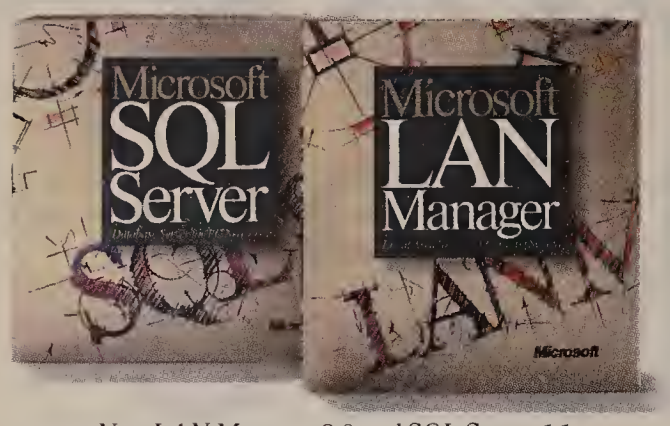

New LAN Manager 2.0 and SQL Server 1.1 are now available from Microsoft.

But our network is more than just software, it's a business connection. And one which is based on an important set of principles. Seven to be exact.

The First Principle: Connect with all of the right products.

Like Microsoft LAN Manager version 2.0, Microsoft SQL Server version 1.1, and DCA®/Microsoft Communications Server version 1.0. Used together or in combination with all our desktop applications, these products provide the building blocks for a strategic networking software solution.

Or in simpler terms, information can be shared and exchanged company wide. From every desktop. With speed, reliability and security.

The Second Principle: The strongest connections are those that stand up to the test of time.

Which is why our network is based upon our history as the leading developer of industry standard operating systems.

First, we created MS-DOS®, an operating system so successful 50 million PCs run on it today. Then we introduced the Microsoft Windows™ environment. Perhaps the easiest to use, and therefore the most productive PC environment.

Finally, there's OS/2. The operating system we co-developed with IBM for today's most demanding PC requirements.

So it should come as no surprise that our network is not only the most advanced, but also the most compatible with our industry standard operating systems.

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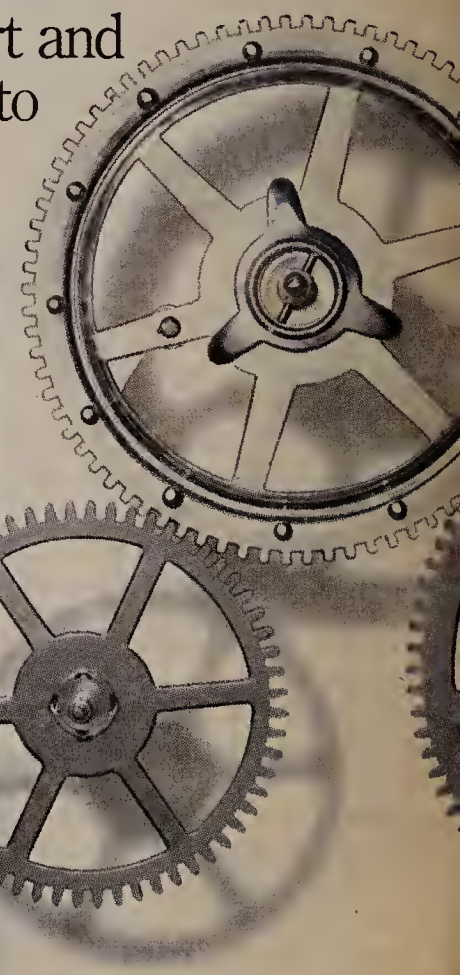
Support and service are key elements to the Microsoft network. That's why unlike other network products, ours are only sold and supported by a select group of Microsoft Authorized Network Specialists. Extensively trained by our experts.

In addition, we offer a solid Customer Satisfaction Program. Along with training at Microsoft University and convenient



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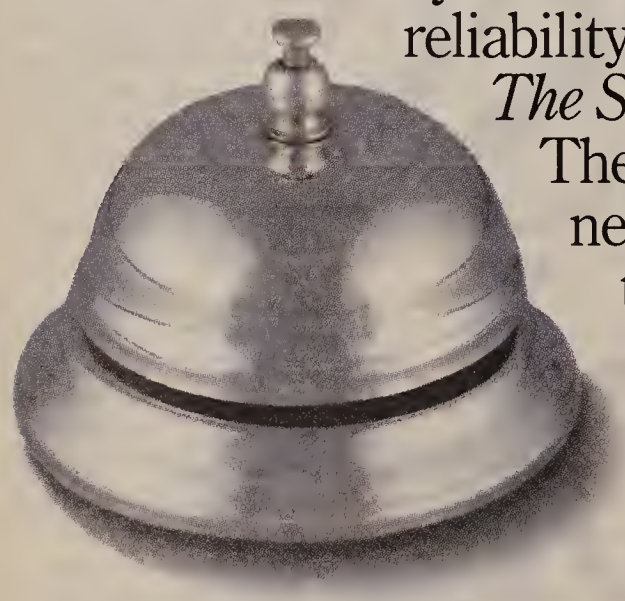

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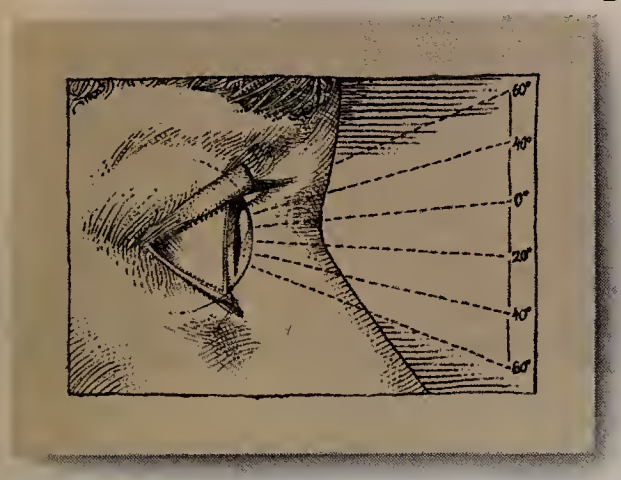
contact by phone, fax, or even modem.

The Fourth Principle: Make sure to connect to a company with a clear vision.



Our vision is to make it as easy to work on a network as it is to work alone.

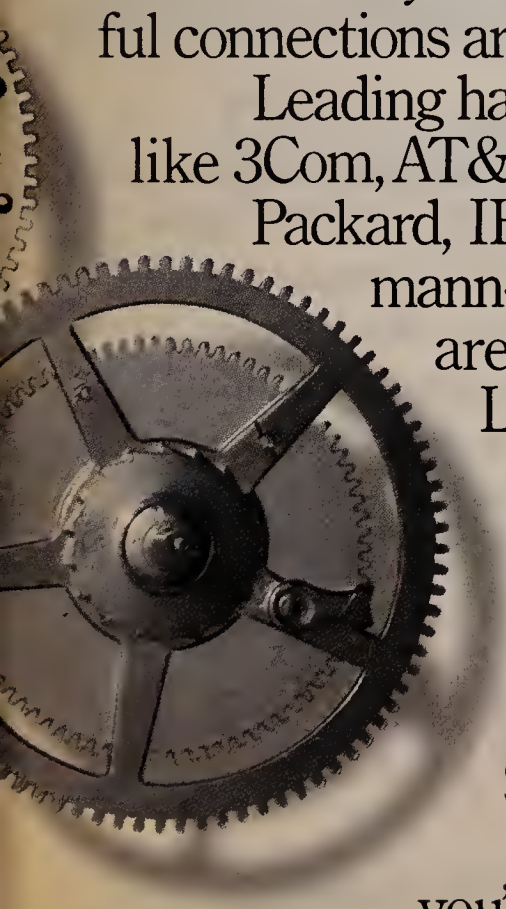
In 1975, Microsoft was founded on a vision. To put a computer on every desk in every home and office in the world.

To bring this vision to life, we developed a wide range of programs that are much easier to use.

Now we're adding another dimension. To make it easy for computers to connect with each other through advanced standard network products that already have broad industry support.

The Fifth Principle: Powerful connections are well connected.

Leading hardware vendors like 3Com, AT&T, DEC, Hewlett-Packard, IBM, NCR, Ungermann-Bass and others are now selling our LAN Manager.

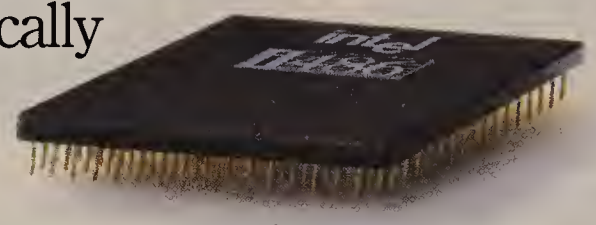


While a number of top software developers have written applications for our products, including Lotus, Oracle, Sybase, and Borland.*

In other words, you're assured of a solution that will meet your particular needs.

The Sixth Principle: A connection should keep you one step ahead.

Our network software products are technologically innovative. Whether it's the pioneering client-server architecture of LAN Manager 2.0, or the safe access of mission-critical information from SQL Server 1.1.



Our products are designed to get the most out of today's more powerful PCs.

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C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other _____

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other _____

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER _____

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER _____

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ OTHER _____

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER _____

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.
B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:
B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	
		LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	**COMPUTERS/PERIPHERALS:**
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers
A	B	**SOFTWARE:**
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	**DATA COMMUNICATIONS:**
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	**TELECOMMUNICATIONS:**
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	**SERVICES:**
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?
B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will you consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER _____

(continued on next column)

NETWORK WORLD
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9616B

Worth Noting

"Industry observers say it would take DEC at least two years to write the software that Vitalink [Communications Corp.] has developed. As a result, we see little near-term likelihood that DEC would seek to terminate its Vitalink alliance."

Michel Guite
Senior vice-president
Salomon Brothers, Inc.
New York

People & Positions

Octel Communications Corp., the Milpitas, Calif., voice mail systems provider, last week named **Douglas Chance** president and chief executive officer of the company.

In accepting the position, Chance steps down from his role at Hewlett-Packard Co., where, until recently, he was executive vice-president for HP's Networked Systems Sector. That division is responsible for the company's Reduced Instruction Set Computer systems, network products, computer manufacturing as well as office products.

Two weeks ago, as part of a reorganization, Chance was moved to a vaguely defined position to perform transition planning.

Chance has been a member of Octel's board of directors since November 1988, when HP bought a 10% stake in the voice-messaging firm.

He will replace **Robert Cohn**, Octel's chairman, who announced nine months ago that he would relinquish his duties as president and CEO now that the company had surpassed $100 million in sales. Cohn will continue to be involved in Octel's long-range planning.

New law would set limits on AOS provider activities

Opponents: Users and vendors could foot the bill.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — President Bush is expected to sign into law soon a congressional bill that would impose stringent requirements on the alternative operator services (AOS) industry.

If signed, the bill, called The Telephone Operator Consumer Services Improvement Act of 1990, would be inserted as an amendment to the Communications Act of 1934 and would guard consumers against price gouging by AOS providers.

Equipment vendors complain, however, that the law could be costly for users and vendors because of mandated equipment modifications that would require all private branch exchange systems to offer callers access to the long-haul carrier of their choice. While newer systems can provide equal access to long-distance carriers, older systems may have to be retrofitted.

AOS companies provide operator services to businesses such as hotels and hospitals. In return for the business, AOS companies typically pay back a commission representing a percentage of the completed call's charge.

But AOS companies have outraged consumers in recent years with service problems and excessive charges. Some callers have had their calls blocked when attempting to avoid AOS providers by using a 10-XXX access code to reach a preferred long-distance carrier.

The new law would require the Federal Communications Commission to monitor the rates and actions of AOS providers. It would also call for the FCC to require installed customer premises equipment to provide equal access to long-distance carriers within a reasonable amount of time.

Alternatively, the law would require AOS providers to offer toll-free access to long-distance carriers, enabling consumers to access their carrier of choice.

The law directly affects customer premises equipment manufacturers by requiring that any equipment and software manufactured in the U.S. or imported after 18 months of the law's enactment be capable of providing equal access on interstate calls.

Bob Aldrich, attorney for the North American Telecommunica-

(continued on page 10)

INDUSTRY BRIEFS

Aggregators unite. A group of 20 long-distance service aggregators last week announced the formation of an organization that will present a unified front in dealing with AT&T on issues regarding resale of AT&T's Software-Defined Network (SDN) services.

The Interexchange Resellers Association's founders believe that AT&T has not committed sufficient resources to supporting SDN resellers, according to Spencer Perry Jr., the organization's executive director. Perry spent 14 years with AT&T, most recently as district manager for carrier sales in AT&T's channel development operation center.

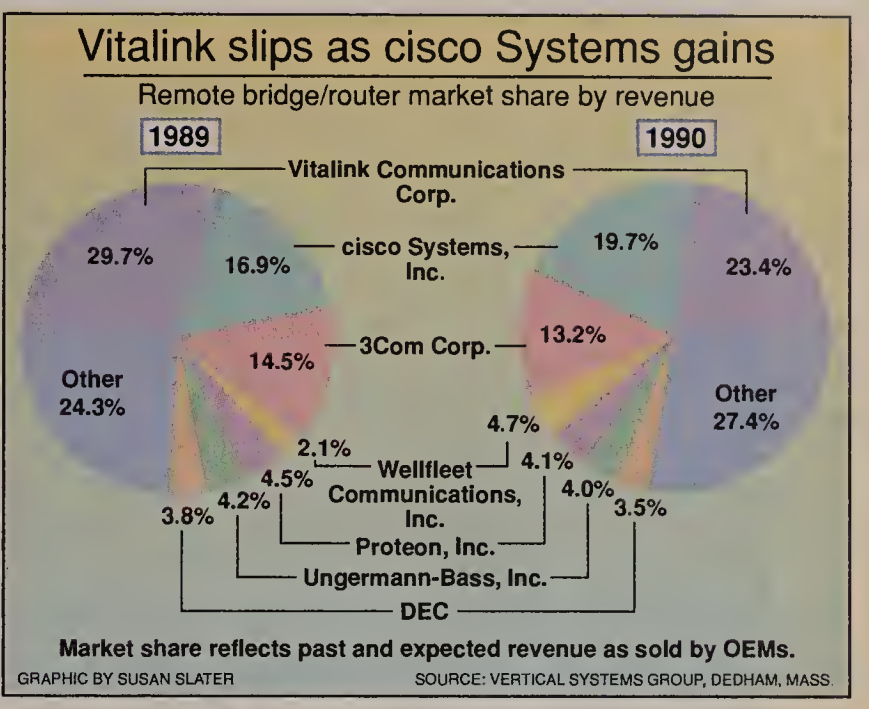
"Resellers of SDN need to focus on certain immediate issues because AT&T is now developing its policies on dealing with this segment," Perry said.

SDN aggregators typically reap volume discounts from AT&T by consolidating the telecommunications traffic of multiple users to offer them larger discounts than they could obtain individually under SDN.

AT&T has grown increasingly cool toward SDN aggregators in recent months because of the questionable business practices of some members of the emerging industry, among other reasons, Perry said.

New watchdog on the job. Fifteen software vendors joined together last week to form the Software Business Practices Council, which was established to discourage misleading advertising on product delivery and benchmarking as well as questionable financial reporting practices plaguing the software industry.

(continued on page 64)



Vitalink expected to post soft financials

Results for 4Q would be latest of several setbacks weakening firm's lead in internetworking mart.

By Bob Brown
Senior Editor

FREMONT, Calif. — Vitalink Communications Corp. is expected to post relatively flat earnings and sales today for its fiscal fourth quarter, capping a year of setbacks that have weakened the internetworking industry's market leader.

Although Vitalink needs to bolster sales, company officials said they would not resort to short-term price cutting but instead will maintain their current strategy of rolling out enhancements to the TransPath line of bridge/routers during the next several months.

Analysts said they expect Vitalink to report earnings and revenue on a par with third-quarter results announced in July, in which earnings dropped 50% to $2.4 million on revenue of $15.8 million. Sales for the third quarter this year remained flat compared to the corresponding quarter of last year, in which Vitalink posted revenue of $15.7 million.

"Vitalink definitely has lost its momentum," said Rick Kimball, an analyst at Montgomery Securities, Inc., a San Francisco brokerage firm.

"They need to be more competitive on pricing, bring out new products and diversify their distribution channels," he said.

Series of setbacks

Already this year, Vitalink has suffered from several events that have stripped it of its market momentum.

In June, George Archuleta, who led Vitalink to the top of the remote bridge market in the 1980s, unexpectedly resigned as president and chief executive officer just before Vitalink announced its third-quarter financials. The company then coaxed board member Donald Herman, a retired NCR Corp. executive, to guide the company and its search for a new top executive. Through this period, some observers claim Vitalink became "a rudderless boat."

Although reluctant to talk about the company's financial woes, Herman revealed in a recent telephone interview that Vitalink is hoping to announce the appointment of a new leader soon.

"Vitalink definitely has lost its momentum," said Montgomery Securities' Rick Kimball.

▲▲▲

Further compounding matters, Vitalink just last month announced a round of layoffs in which 32 employees, or 10% of its work force, were let go ("Vitalink lays off 32," *NW,* Sept. 24). At the time of that announcement, Herman admitted to "a slowness in orders worldwide."

Meanwhile, the company's competition has increased dramatically as buyers shifted market demand from bridges — Vitalink's traditional area of strength — to multiprotocol routers, a market Vitalink was late to join.

(continued on page 10)

Vitalink expected to post soft financials

continued from page 9

In addition, the bridge and router markets are now beginning to merge as users call for internetworking tools that support bridging and routing functions. Consequently, Vitalink has been left to play catch-up with other companies — most notably cisco Systems, Inc. — that offer a wide range of protocol support on their routers.

In fact, cisco Systems — considered by many observers as the leading router supplier — has started to close the gap in the overall bridge/router market with Vitalink, according to "Private Network Industry Analysis: 1990-1991," a report from Vertical Systems Group, a Dedham, Mass., market research firm (see graphic, page 9).

Taking steps

Vitalink needs to bolster its router line to complement its bridges and to compete more effectively with cisco Systems and a host of other companies, analysts said.

In addition, the company needs to lessen its dependency on a reseller agreement with Digital Equipment Corp., which observers said accounts for more than 40% of Vitalink's sales.

Paul Schaller, Vitalink's vice-president of marketing, said the company is addressing these issues to serve users better. He pointed to the fact that the company cut prices on hardware for certain bridge and router products by 15% last May and also to Vitalink's recent consolidation of sales offices to coordinate its direct sales efforts better.

Vitalink is making its biggest push to get back on track by boosting its router offerings. Although he would not provide details, Schaller said a significant portion of the company's research and development budget is going to augment the support of various transport protocols on its TransPath bridge/routers.

In August, Vitalink promised support for Xerox Corp.'s Xerox Network Systems protocols, as well as an Ungermann-Bass, Inc. version of XNS and Novell, Inc.'s Internetwork Packet Exchange (IPX) protocol. Software supporting those protocols is expected to ship this month. The TransPath line previously supported Transmission Control Protocol/Internet Protocol.

In addition, Vitalink announced plans last July to support DECnet Phase IV protocols in the first half of next year. Last week, the company said it would also support DECnet Phase V sometime after DECnet Phase IV.

"They need to add protocol support," Montgomery Securities' Kimball said. "They have some catching up to do" with cisco Systems and other router vendors, he said.

Vitalink may also need to bring some bridge/router prices in line with those of competing vendors, observers said. The company's recently announced low-end TransPath 335 bridge/router sells for $13,500, hardly what some analysts consider to be low priced, given the market's general slowdown in sales caused in part by the weakening economy.

Rosemary Cochran, a principal at Vertical Systems Group, said the combination of Vitalink's high prices and its need to support more protocols have made its customer base particularly vulnerable. This is because many of Vitalink's customers installed their bridges several years ago and may be looking to upgrade, she said.

"Vitalink is no longer the only game in town," Cochran added.

Vitalink and DEC

Vitalink's relationship with DEC has been a great source of revenue, but it is also considered one of the company's great weaknesses, according to Susan Frankle, an analyst at International Data Corp., a Framingham, Mass., market research firm. She recently wrote in a report that Vitalink could be hurt "should it lose DEC as a channel of distribution," given that DEC accounts for more than 40% of Vitalink's sales.

Under a 1988 agreement, DEC resells Vitalink's TransLAN Ethernet bridges.

But it seems unlikely that Vitalink and DEC will part ways any time soon, analysts said. In fact, last week DEC announced an agreement to sell, service and support Vitalink's TransPath 350 remote Ethernet bridge/routers worldwide.

Vitalink's Schaller acknowledged that relying so much on one customer — even DEC — is not an ideal situation.

"Would I like our sales to DEC to be lower?" he asked. "No, but I'd like for our non-DEC business to be greater."

Law would set limits on AOS activities

continued from page 9

tions Association (NATA) trade organization, said a study of 1,200 PBX systems showed that retrofitting for equal access would require hardware and software changes estimated at between $7,000 and $22,000 per site.

Although NATA members are not opposed to designing new equipment to satisfy the law's requirements, Aldrich said manufacturers are opposed to retrofitting older equipment.

Aldrich also said the 10-XXX interexchange access code system may be substituted in a few years by a quadruple X system such as 101-XXXX in order to broaden the numbering system.

If that happens, the equipment would have to be upgraded again. "We don't want to do it twice," Aldrich said.

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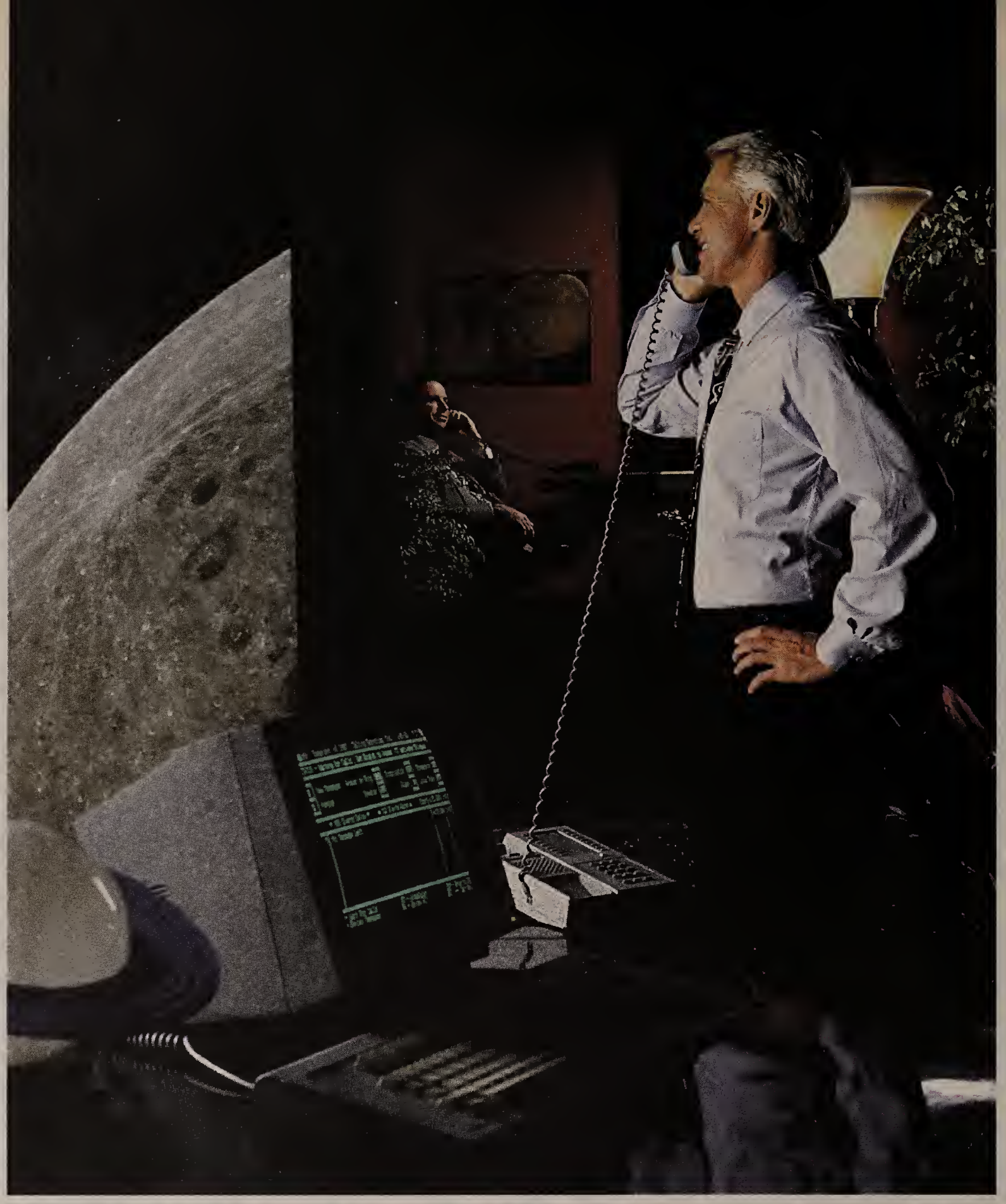

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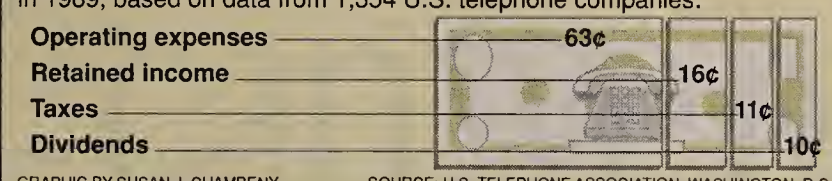
Worth Noting

Northern Telecom, Ltd. has invested $250 million in the research and development of its FiberWorld Synchronous Optical Network switching and transmission equipment, a figure that will reach $2 billion by 1992, according to the company's annual report.

RBHCs' 1989 network expenditures

RBHC	Access lines (millions)	Exchanges	Regulated construction expenditures (billions of dollars)
Ameritech	15.90	2,434	$2.01
Bell Atlantic Corp.	17.06	962	$1.66
BellSouth Corp.	16.72	1,177	$2.95
Nynex Corp.	14.96	3,776	$2.07
Pacific Telesis Group	14.20	476	$1.51
Southwestern Bell Corp.	11.44	881	$1.34
US West, Inc.	12.31	1,472	$2.17

How each dollar paid to a local telephone company was spent on average in 1989, based on data from 1,354 U.S. telephone companies:



GRAPHIC BY SUSAN J. CHAMPENY SOURCE: U.S. TELEPHONE ASSOCIATION, WASHINGTON, D.C.

Carrier Watch

Southwestern Bell Telephone Co. last week announced MaxiMizer 800, a service that enables companies to receive intra-LATA toll-free calls over regular telephone lines.

Southwestern Bell has filed a tariff for the service in Missouri and Oklahoma and plans to tariff the service in Arkansas, Kansas and Texas, but declined to say when.

One of the service's optional features, Variable Call Destination, will enable calls to a single 800 number from multiple LATAs to be routed to a local office within the same LATA.

Businesses may order optional Call Detail reports that list when each toll-free call was made and the duration of that call.

MaxiMizer costs $10 per line per month and carries per-hour usage charges. Customers pay $13.50 per hour for the first 10 hours and $12 per hour for usage over 10 hours. Fractions of hours will be billed in six-minute increments.

Metropolitan Fiber Systems (MFS) of Chicago, Inc. recently announced a five-year contract to provide alternate access services to the Chicago Board of Trade, the nation's largest commodity exchange.

The trade board began using MFS-provided alternate

(continued on page 14)

Say goodbye to Tariff 12 and hello to dialing dogs

Users must meet certain Tariff 12 qualifying rules.

By Daniel Briere
Contributing Editor

Users may see a decrease in the number of companies that land AT&T Tariff 12 deals, according to AT&T sources, and an increase in telecommunications fraud perpetrated by domestic pets, according to reports in the general press.

COMMENTARY

On the serious front, it seems that if you have been waiting for the right time to jump on the Tariff 12 bandwagon, you may have waited too long.

Internal AT&T sources say that in order to meet the requirements for new customers, the user must provide a substantial amount of win-back traffic — in other words, traffic converting from a non-AT&T carrier back to AT&T. Also, AT&T wants to be the user's sole carrier. This is difficult to enforce, however, particularly with larger customers. And lastly, the traffic has to be all interstate since AT&T's Tariff 12 is only an interstate offering.

Similar pricing can be obtained by the right combination of AT&T's generally tariffed services. Moreover, Tariff 12 will probably be unnecessary in the next year since the Federal Communications Commission is now deregulating the carrier. AT&T will soon have the pricing flexibility to create these packages without the burden of an FCC tariff.

The net result is that AT&T is not eager to discuss Tariff 12 with many newcomers and is equally tentative about renewals on existing Tariff 12 offerings. Most existing contracts have renewal options, however.

It seems likely that the nightmare AT&T has experienced supporting the custom offerings has prompted it to start drawing the line.

On a lighter note, it seems a new type of long-distance fraud is making the rounds, as Tom and Bonnie Robb of Aliso Viejo, Calif., can attest.

When their telephone bill arrived recently, they had a difficult time figuring out who had made $28 worth of toll calls to Sports Pick and the Adult Date Line, according to a recent story in *The Hartford Courant.*

> AT&T will have the pricing flexibility to create packages without an FCC tariff.
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But it turned out to be their cocker spaniel, who was using a large-faced push-button telephone. The Robbs had attempted to teach the dog to dial 911 by smearing peanut butter on the corresponding buttons of the keypad.

The dog had apparently taken to knocking the handset off the receiver and dialing telephone numbers, inadvertently dialing the 900 numbers.

Unisys expanding its Tariff 12 agreement

Company adds Global SDN service to Tariff 12 deal while it doubles its T-1 backbone network.

By Bob Wallace
Senior Editor

BLUE BELL, Pa. — In its ongoing effort to reduce costs, Unisys Corp. has incorporated new services and applications into its AT&T Tariff 12 custom network that will help the mainframe maker save $10 million annually.

In the year since Unisys signed up for a Tariff 12 deal, it has expanded its custom net to include use of AT&T's Global Software-Defined Network (SDN) service and doubled the size of its T-1 backbone net to help support applications such as videoconferencing.

"Although we're amidst financial difficulties, we continue to invest in state-of-the-art voice and data products, videoconferencing and teleconferencing because they have short-term paybacks," said Gil Piddington, staff vice-president of worldwide telecommunications for Unisys.

The Tariff 12 deal culminates a 3½ year crash course in cost containment. For most of the 1980s, Unisys used AT&T's Enhanced Private-Switched Communications Service (EPSCS) for its voice networking needs and a separate analog point-to-point private-line network for data communications.

ETN and SDN

In early 1987, the company consolidated its voice and data traffic onto an eight-node T-1 based electronic tandem network (ETN).

Later that year, Unisys awarded AT&T a contract for a 100-site SDN, which the company linked to its ETN to form a hybrid voice/data network.

The use of SDN enabled Unisys to cut its cost per call minute from more than 30 cents with EPSCS to roughly 20 cents.

Of the roughly seven million minutes of traffic carried on the hybrid net each month, about four million minutes were supported by the SDN, according to Bard Haerland, former staff vice-

(continued on page 14)

WASHINGTON UPDATE

BY ELLEN MESSMER

Supreme Court refuses to review decision. The U.S. Supreme Court has declined to review a decision by the U.S. Court of Appeals that ordered U.S. District Court Judge Greene to review his Modified Final Judgment decision prohibiting the entry of regional Bell holding companies into information services.

The request for Supreme Court review came last May in a group petition filed by MCI Communications Corp., the Independent Data Communications Manufacturers Association, Inc., the Consumer Federation of America and several others. The court gave no reason for denial of the petition.

FCC rejects Southwestern Bell tariff. The FCC recently rejected Southwestern Bell Telephone Co.'s customer-specific tariff for "Self-Healing Network Option 1" after determining that the company had not supplied the proper cost-support data.

Southwestern Bell filed the customer-specific tariff last May after AT&T awarded the company a contract to build an interoffice fiber-ring network in the Houston area that would be capable of restoring downed circuits.

In rejecting the tariff, the FCC did not rule on substantive issues raised by the filing, such as the legality of customer-specific offers, but it said that repeated requests for additional cost-support data remained unfulfilled. Southwestern Bell Project Manager Ed Wilkison said he was baffled by the FCC's rejection of the cost-support material submitted but added that the company would submit more data.

The fiber network has since been completed for AT&T, but AT&T cannot make use of it until the tariff is approved.

Unisys expanding its Tariff 12 agreement

continued from page 13

president of worldwide telecommunications. Haerland is now vice-president of network strategy and management for the firm's communications and networks group.

Just over a year ago, Unisys became the 16th of more than 70 U.S. corporations to enter into a Tariff 12 arrangement with AT&T when it signed a five-year $16.1 million contract for a custom voice/data network comprising its hybrid ETN/SDN.

Unisys now pays less than 10 cents per call minute for each call carried by its Tariff 12 Virtual Telecommunications Network Service (VTNS), Haerland said. "We are simply delighted with these rates."

A clause the company worked into the VTNS agreement will give Unisys lower rates if service prices fall below those delineated in the contract.

"We had to leave ourselves some contractual options that would protect us from being locked into uncompetitive rates," Haerland recalled.

But Unisys has been pleased with the VTNS rates. "Our VTNS has worked out quite well for us," he said. "We feel comfortable with the length of the contract and the conditions we got.

"We decided to go with a VTNS because we saw it as a valuable means of reducing our current communications costs while cost-effectively expanding our network," Haerland said.

However, Unisys' shift to VTNS was bad news for US Sprint Communications Co., which in early 1989 signed a contract to provide employees at 900 Unisys sites with a variety of services primarily for off-network calling. "We still use some [US Sprint] services," Haerland said. "But Tariff 12 gives us a powerful incentive to move away from them and toward AT&T."

In the two years since it signed up for VTNS, the company has doubled the size of the nationwide T-1 backbone covered in the contract from around 50 links to more than 100, Piddington said. "We're adding more locations to the network, installing redundant routes and increasing network capacity."

Unisys has also expanded its VTNS to cover its use of AT&T's Global SDN offering, which the mainframe maker beta-tested and now uses to extend seven-digit dialing to and from offices in the U.K. and Sydney, Australia, Haerland said.

> Unisys pays less than 10 cents per call minute for calls carried by its Tariff 12 VTNS.
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Beta user

"We were one of the first to beta-test Global SDN and have now been using it for the better part of a year," he said. "It does everything we want it to do, and we expect to use the service globally."

Piddington said Unisys wants to use Global SDN to tie sales, marketing, engineering, manufacturing and distribution locations around the globe to its world headquarters here.

Unisys already uses videoconferencing to link these far-flung sites. The company is building its second private videoconferencing room here, has more than 10 others throughout the U.S. and uses US Sprint's meeting channel where it does not have private videoconferencing rooms.

Haerland said Unisys uses videoconferencing for management meetings and will run up 5,000 hours of usage by year end. "It's an enormous productivity booster and cost saver."

Carrier Watch

continued from page 13

access services several years ago. "MFS is offering competition in the last mile of telecommunications, and we are benefiting from more secure, higher quality and more cost-effective local [access]," explained Roger Martinez, telecommunications director for the trade board.

Metropolitan Fiber Systems of New York, Inc. last week said it will soon begin construction of its New York headquarters at the Broad Financial Center in New York. The facility will house the firm's sales group and the control center used to manage its planned fiber-optic bypass network.

Micronet, Inc., a long-haul carrier located in Jamison, Pa., recently sold six 45M bit/sec T-3 links on its digital microwave network to **RCI Corp.,** a regional carrier based in Rochester, N.Y.

RCI said it will sell capacity on the T-3 links, which run from Warwick, R.I., to New York, to large corporations, government agencies and other carriers for voice, data and video applications.

Micronet operates a 500-mile digital microwave network in the Northeast and similar networks in the West and Southwest.

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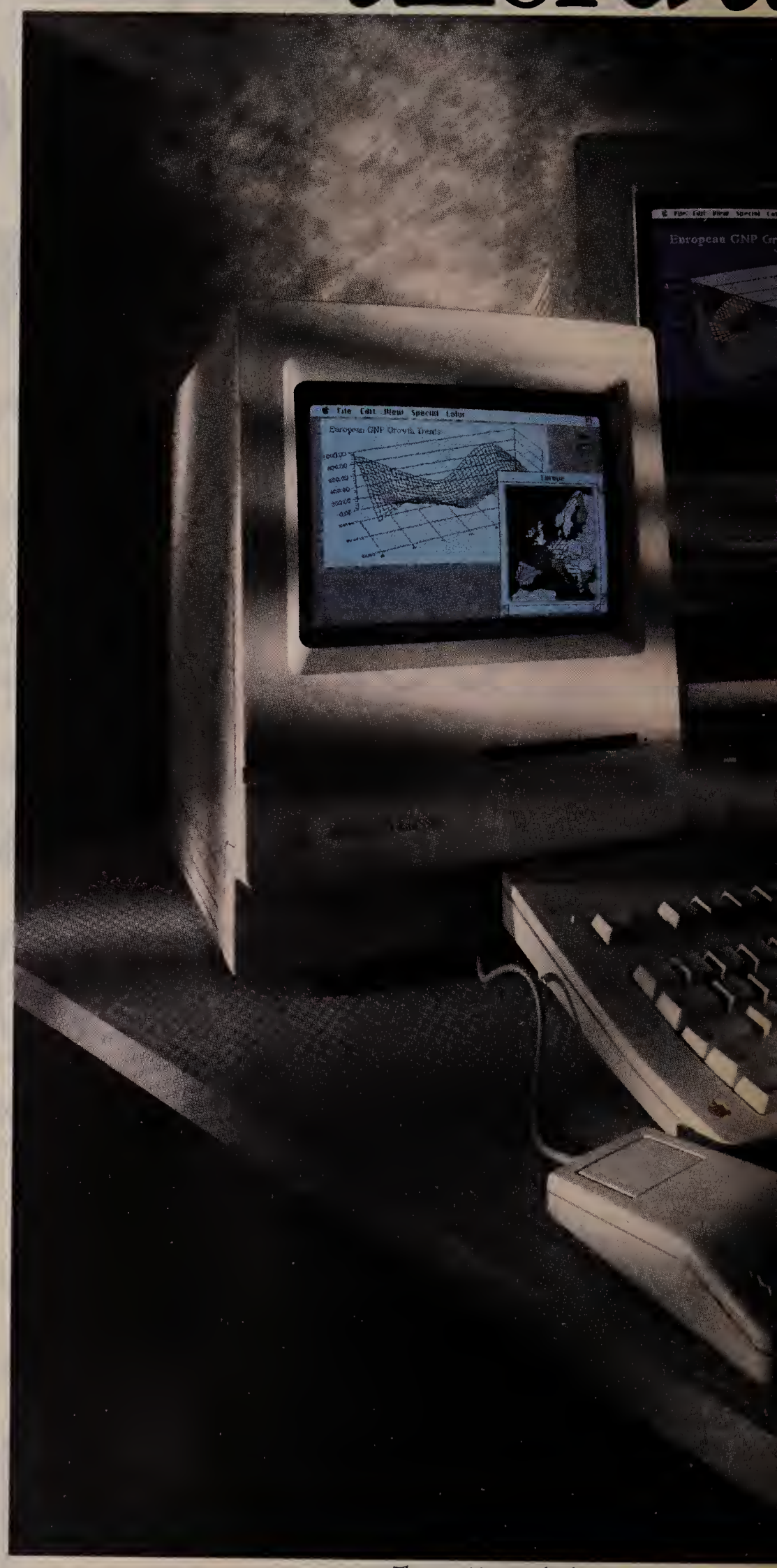
A 40MB hard disk is optional.

Its processor is an 8 MHz 68000 chip. And it outperforms even its popular predecessor, the Macintosh SE.



The new Macintosh Classic, Macintosh IIsi, and

* *The figures are included in a 1990 study conducted by Diagnostic Research, Inc., among* Fortune *1000 managers and business computer users familiar with Macintosh and MS-DOS or Windows systems. Call and we'll send you*

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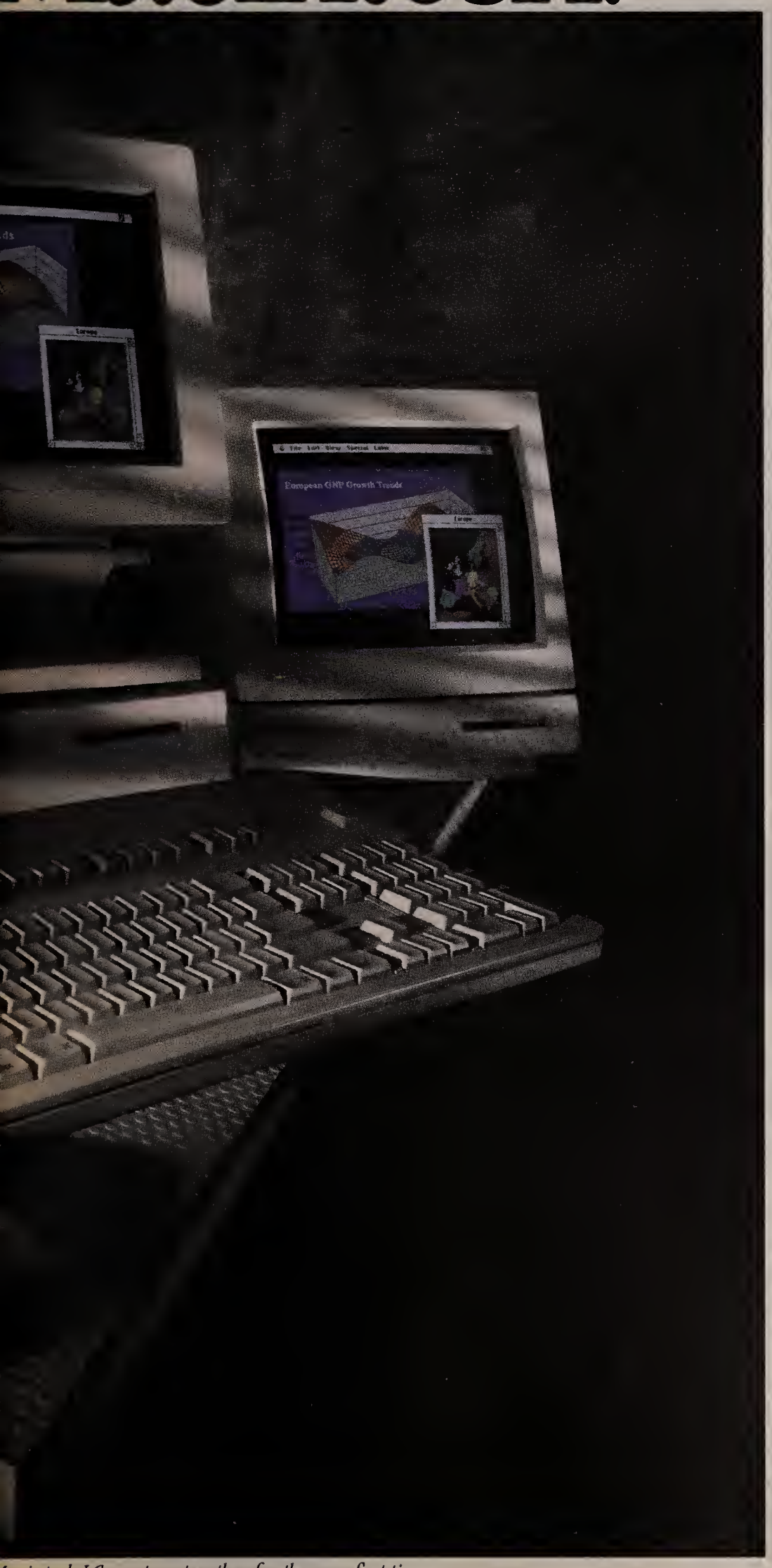

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See The FAXNeT Form on Page 51

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

"If you look at X.25, it provides a lot of the same features as frame relay, such as a single interface into a [network] cloud that gives you access to multiple points."

Nick Lippis
Principal
Northeast Consulting Resources, Inc.
Boston

Data Packets

Clear Communications Corp. of Lincolnshire, Ill., last week announced it will upgrade its Clearview Surveillance System to collect extended superframe format (ESF) data from Verilink Corp.'s 551VST L2 and 4016R T-1 channel service units (CSU).

Clearview, an expert system-like program running on Sun Microsystems, Inc. SPARCstations, will collect the ESF performance data every 15 minutes from Verilink CSUs positioned in the network.

This enables the package to produce T-1 performance trend reports, thus helping customers more easily determine if their carriers are meeting guaranteed performance levels.

Armed with this information, users can demand refunds if performance guarantees are not met.

Verilink CSUs will continue to be controlled from Verilink's microcomputer-based Verinet 2 management system.

Clear Communications previously announced a similar arrangement with Larse Corp. of Santa Clara, Calif. Under that agreement, Clearview will collect ESF data from Larse's T-1 Network Diagnostic System T-1 CSUs.

The upgraded version of Clearview will provide support for both Verilink and Larse CSUs; it will also support Verilink CSUs that are resold by AT&T.

NSC router can handle T-3 speeds

By Jim Brown
Senior Editor

SAN JOSE, Calif. — Network Systems Corp. (NSC) last week bolstered its line of Fiber Distributed Data Interface network routers with a model that links remote FDDI nets at up to T-3 speed.

Introduced at the INTEROP 90 Conference and Exhibition here last week, the FE648 router resides on an FDDI backbone and is connected to either a single T-1 or T-3 link. NSC said it will upgrade the FE648 by next year to support as many as four T-1 circuits or a single T-3 link.

The FE648 includes an NSC Dual Attach Station interface, which enables the router to be attached to both pairs of fibers used in FDDI's dual counterrotating ring topology. The router also complies with ANSI X3T9.5 specifications, which define the operation of an FDDI network.

On the wide-area network side, the FE648 features a single V.35 or V.11 port that supports connection to a T-1 or T-3 line.

The FE648 routes Transmission Control Protocol/Internet Protocol, Digital Equipment Corp. DECnet, and Apple Computer, Inc. AppleTalk Phase II traffic between FDDI nets. A future version will route Novell, Inc. Internetwork Packet Exchange (IPX)/Sequenced Packet Exchange traffic.

The FE648 routes approximately 10,000 packet/sec and will support packets of variable lengths.

NSC employs its own proprietary protocol to enable FE648s at either end of the T-1 or T-3 link to communicate. The new product also supports several standard Internet protocols that enable different vendors' routers on

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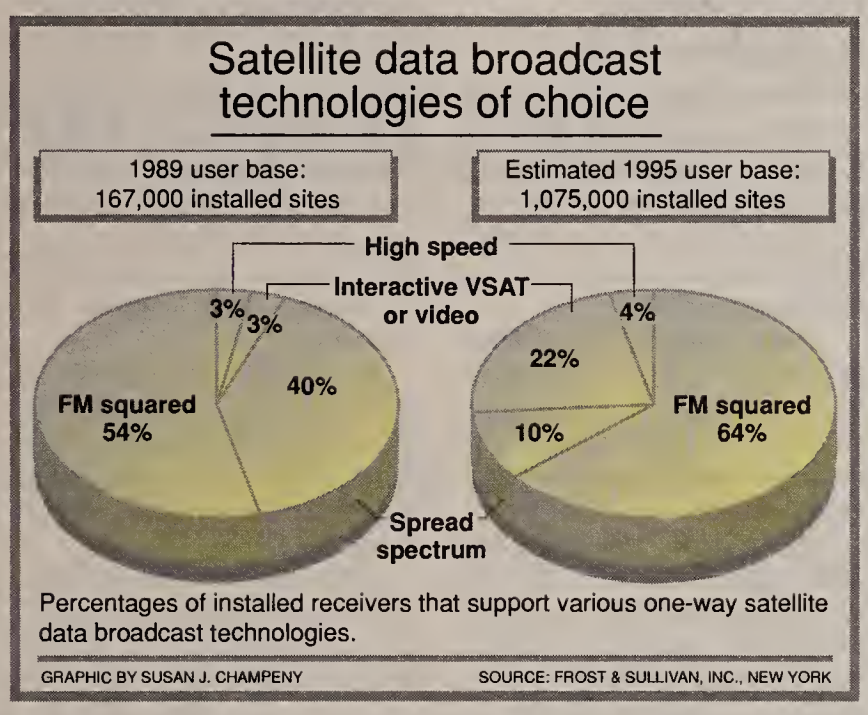

One-way data broadcast market expected to grow

By Jim Brown
Senior Editor

NEW YORK — New applications and the introduction of more affordable equipment are spurring user interest in one-way satellite data broadcast services, according to a recent report from Frost & Sullivan, Inc.

The report, which examines the market for one-way data transmission services and equipment, predicts that the number of user sites equipped to support one-way data broadcasts, such as financial data feeds, will jump from 167,000 in 1989 to 1,075,000 by 1995.

According to the study, titled "Market for Satellite Data Broadcasting," so-called background music companies and newsletter publishers are devising new applications for one-way data broadcast services.

Background music suppliers can eliminate the high cost of delivering tapes to customers by transmitting digitized music to receivers at customer sites. Publishers can save money and lower subscription rates by transmitting newsletters to customers to avoid printing and mailing costs.

Data broadcasting also positions these firms to offer add-on services, such as electronic mail, that support distribution of such options as memos and price lists.

Technology is also making data broadcast services more af-

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Unisys IIE plan gets lukewarm reception

Analysts say it's a step in the right direction but too weak to lure users from other net platforms.

By Paul Desmond
Senior Editor

NEW YORK — Unisys Corp.'s newly announced Integrated Information Exchange (IIE) architecture, which promises to marry the company's disparate product lines and provide Open Systems Interconnection networking, is being applauded by some analysts, although some said it won't lure new users from other architectures.

Some analysts said they expect the company's new IIE will make Unisys a dominant force as a provider of OSI networking. Others were less enthusiastic, saying it may keep current users in the fold but offers nothing unique to attract users from IBM's Systems Application Architecture or Digital Equipment Corp.'s Network Applications Support (NAS).

"I just don't see defections from the major architectures happening," said Duncan Hare, program director of global network strategies at the META Group, a Westport, Conn.-based consultancy.

Unlike rival architectures, analysts said, IIE defines three distinct computing platforms — information hubs anchored by mainframes, Unix servers and workstation/work groups — while also emphasizing the use of OSI protocols and applications.

"I just don't see defections from the major architectures happening," said the META Group's Duncan Hare.

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SAA, NAS and architectures from minicomputer makers such as Hewlett-Packard Co. and NCR Corp. address either multiple platforms or OSI, but not both, analysts said.

Current Unisys users may view IIE as a promising foundation that will enable them to tie together the company's varied mainframe lines, Unix servers and workstations acquired since Burroughs Corp. and Sperry Corp. merged to form the company in 1986. But analysts don't expect IIE to fuel much-needed customer growth. Rather, the emphasis on OSI may help Unisys equipment coexist with machines from rivals.

"Unisys wants to get a place at the table, but it's a place at somebody else's table," said John Rymer, senior editor for "Networking Monitor," a monthly report published by Patricia Seybold's Office Computing Group, Inc. in Boston. "They can't afford to fight IBM head-to-head. They have to live in a world defined by IBM to survive."

"Unisys wants to get a place at the table, but it's a place at somebody else's table," said John Rymer of "Networking Monitor."

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In fact, IIE defines a class of services intended to address interoperability with proprietary systems — most notably, IBM's Systems Network Architecture — for which Unisys already has an extensive array of connectivity products. This complementary class of products also includes products that support SQL data base interfaces.

Those SNA connectivity products separate IIE from NCR's Open Cooperative Computing Architecture, while support for mainframes gives it a boost over DEC's NAS, Rymer said.

In addition, numerous Unisys OSI products, including an X.400 Message Handling System and File Transfer, Access and Management software, exist today while other companies are still promising such products.

Michael Goulde, an analyst with "The Open Systems Advisor," a newsletter in Boston, said one factor that separates IIE from SAA is its OSI emphasis. Unisys went so far as to say it would comply with guidelines set by X/Open, the industry group committed to open systems that brands products OSI-compatible.

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Unisys plan gets tepid reception

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"SAA is not designed to provide multivendor interoperability," Goulde said. "If you look at SAA, NAS or any other architecture, no one has come out with that endorsement of X/Open."

Other analysts also applauded Unisys' emphasis on OSI.

"They're going to be one of the vendors that aggressively push the move toward OSI," said Kevin O'Neill, an analyst with Business Research Group in Newton, Mass.

IIE uses OSI protocols to link disparate Unisys hardware platforms: A Series and 1100/2200 Series mainframes, U Series Unix machines, personal computers, and workstations the company acquired with Convergent Technologies, Inc.

"They've put in place a common infrastructure based on open systems," Rymer said. "IBM has not done that; SAA is proprietary."

SAA also does not encompass AIX, IBM's version of Unix, which means users are forced to build gateways between the two environments, Rymer said. In contrast, IIE espouses using multitasking Unix servers as regional or departmental computers serving multiple local-area networks.

Even given all its features, analysts were skeptical about whether IIE could rescue the financially ailing Unisys. The company's stock fell more than 20% the week IIE was announced. During that same week, the firm also revealed it was suspending stock dividend payments and would report a third-quarter loss.

"Unisys is trying to give warm fuzzies to its installed base to stop them from deserting in droves," Hare said. "The prognosis is poor. I think Unisys has a chronic disease called lack of new customers."

The company's financial situation could make it difficult for Unisys to deliver on the promise of IIE, analysts said.

"I don't see the architecture as deliverable," Hare said, noting that other vendors face the same problem.

"All these big software products are in huge trouble and won't ever deliver," he said. "It's all market hype."

Goulde echoed Hare's remarks. "It takes more than an architecture to succeed. You have to build and deliver the products that implement the architecture," he said. "We're going to have to wait and see."

Unisys enhances X.400, FTAM for 1100/2200

NEW YORK — As part of its architecture announcement here recently, Unisys Corp. unveiled enhancements to its OSI X.400 electronic mail and file transfer applications for its 1100/2200 Series mainframes.

Unisys also announced that existing versions of its X.400, File Transfer, Access and Management (FTAM) and base Open Systems Interconnection software will be available for the first time on its A Series mainframes, the last Unisys hardware platform to support them.

All of the OSI products fall under the category of Distributed Systems Services (DSS) within Unisys' new Integrated Information Environment architecture (see "Unisys unfolds open network blueprint," *NW,* Oct. 8). DSS products support data distribution and resource sharing in a network, largely by using OSI protocols.

Unisys announced new 1988 CCITT X.400 Message Handling System software for its 1100/2200 Series mainframes to replace a 1984 version already supported.

The 1988 version supports a feature that lets users store messages in a mailbox for later retrieval if the addressee's node is inactive, said Philip Wimpenny, program development manager in Unisys' Computer Systems Group. In the 1984 version of X.400, if the recipient's system was not active, the message could not be delivered, Wimpenny said. He added that the same capability would be rolled out for Unisys' other systems during the next year.

In addition, Unisys beefed up the OSI FTAM application for the 1100/2200 Series by adding an error recovery feature. The feature lets the application automatically recover from a system error or communications failure, determines how much of the file transfer was completed before the error and completes the transfer from that point.

Also last week, Unisys announced it is extending its OSI services to its A Series mainframes. The A Series will be able to run the 1984 X.400 application, FTAM and Unisys' OSI InterProcess Communications (IPC), which provides the base OSI protocols on which Unisys or user-written OSI applications are supported.

All of the new OSI applications will be available in the first quarter of 1991.

OSI products for the A Series are priced as follows: FTAM ranges from $2,300 to $25,000, X.400 ranges from $3,000 to $33,000, and OSI-IPC ranges from $4,000 to $45,000.

The 1988 X.400 product for 1100/2200 mainframes will be provided free of charge to users of the 1984 X.400 product. The software's price ranges from $29,000 to $137,000, the same pricing as the 1984 version.

— Paul Desmond

NSC router handles T-3

continued from page 19

TCP/IP networks to exchange information about devices. Among those standards are the Exterior Gateway Protocol, the Routing Information Protocol and the Hello protocol.

A future version of the FE648 will support Internet's Point-to-Point Protocol, which enables different vendors' routers to transmit a mix of traffic over synchronous links.

The FE648 also supports NSC's Packet Control Facility (PCF) software, which provides users with security, network monitoring and billing features. PCF enables users to prevent certain devices from forwarding traffic to another network or from receiving data from devices on another network.

The new router also tracks the type of traffic being transmitted and determines whether the traffic reached its destination, helping users detect network link problems.

By examining the network address of both the sending and target device, PCF can maintain statistics about who is sending or receiving data. This aids users in chargeback.

Users can run PCF software from an asynchronous terminal directly attached to an RS-232 port on the FE648 or from any device on the FDDI network that supports TCP/IP's Telnet virtual terminal protocol.

The FE648 also includes Simple Network Management Protocol (SNMP) agent software, thus enabling workstations running SNMP-based net management software to monitor and control the device.

The FE648 comes standard with an optical bypass feature that enables users to shut it off for servicing without affecting the rest of the FDDI network. This feature enables a nonfunctioning FE648 to forward light impulses received from one adjacent node to the next.

The FE648 is available now and costs $50,000.

One-way data market to grow

continued from page 19

fordable. Services offered via Ku-band satellite transponders that transmit data using FM squared technology are less expensive than services that employ C-band transponders to transmit data using spread-spectrum technology.

This is because Ku-band receivers cost less than $2,000 while C-band receivers cost $3,000 or more, said Linda Bower, an independent consultant in Chevy Chase, Md., and project director for the report.

Ku-band receivers cost less because they are smaller and because the circuitry required to receive FM squared signals is less expensive than that needed to receive spread-spectrum signals.

FM squared receivers use a technique that divides the bandwidth of a satellite transponder into several subchannels, each of which can support speeds of 9.6K bit/sec or less.

Spread spectrum, in which multiple 9.6K bit/sec or slower data signals are encoded and broadcast across a transponder's entire bandwidth, is more reliable, Bower said. But extra receiver circuitry is required to decode incoming signals and extract data for the receiver.

She said the percentage of installed receivers supporting FM squared transmission will jump from 90,180 in 1989, or 54% of all installed receivers, to 688,000 by 1995, or 64% of all installed receivers (see graphic, page 19).

The number of installed spread-spectrum receivers is expected to increase as well, from 66,800 in 1989 to 107,500 in 1995. But the receivers will actually account for only 10% of all installed devices by 1995, compared to 40% in 1989.

According to the report, users with interactive very small aperture terminal networks are increasingly adding support for one-way data broadcasts because the incremental cost is so low. For example, users can buy an add-on device for about $1,000 that enables the VSAT to support data broadcast services at a frequency different from that used to support two-way applications.

Bower said only a small number of users require data broadcast receivers that support speeds greater than 9.6K bit/sec.

The report also addresses the use of receivers that pull in data broadcasts over an FM radio station's sideband channel. This technique is a cost-effective way to reach a large group of users that are within the signal radius of an FM radio station.

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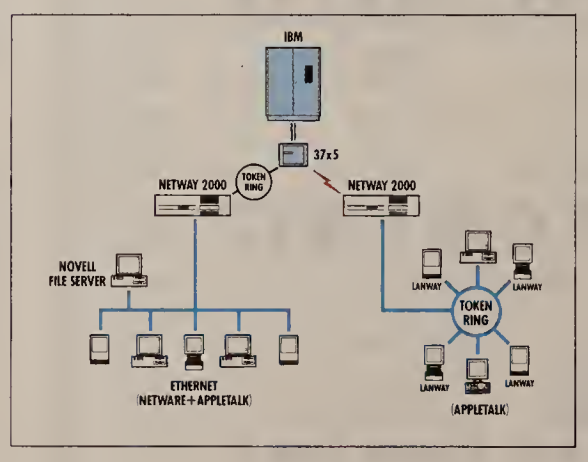

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STRATEGIC DESKTOP CONNECTIVITY

See The FAXNeT Form on Page 51

Worth Noting

Worldwide shipments of Fiber Distributed Data Interface nodes by U.S. vendors are expected to increase 310%, from 1,000 nodes in 1989 to 340,000 in 1993, according to Dataquest, Inc., a market research firm in San Jose, Calif.

Netnotes

The Performance Testing Alliance (PTA), a group of users and vendors trying to establish public domain test methodologies to measure local-area network performance, has formed six subgroups.

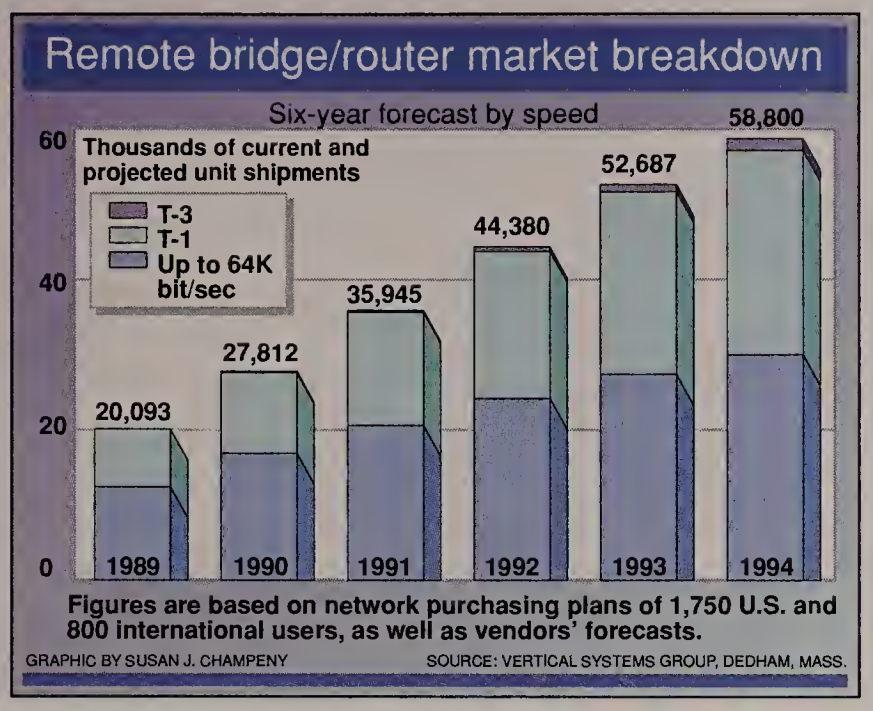
Three of the subgroups — the network interface card working group, the network server working group and the subgroup on routers — were scheduled to meet for the first time at last week's INTEROP '90 Conference and Exhibition in San Jose, Calif.

Scott Bradner, technical associate at Harvard University and chairman of the Internet Engineering Task Force's Benchmark Methodology Working Group, has been chosen to head the routers subgroup. Other subgroup leaders include Ed Curry, president of Lone Star Evaluation Laboratories, Inc., who will head up the network operating systems subgroup, and Gary Gunnerson, manager of Gannett Company, Inc.'s information center, who will be chairing the network server subgroup.

Two other subgroups — one on network applications and the other on network technologies not covered by the other five subgroups — have been formed but were not scheduled to meet at INTEROP. The PTA said it plans to hold its next general meeting in February at NetWorld '91 in Boston. Meetings are open to all users and vendors.

Cisco Systems, Inc. recently announced the CSC-

(continued on page 26)



LAN Sniffer gets WAN link for SNA and X.25 networks

Enables users to analyze internet LAN traffic.

By Tom Smith
Senior Editor

MENLO PARK, Calif. — Network General Corp. recently enhanced its Sniffer local-area network analyzer with a wide-area network option that enables the product to be used to analyze LAN protocols carried over SNA and X.25 links.

The WAN/Synchronous Sniffer Analyzer, an add-on card and software for the company's portable computer-based Sniffer products, allows users to analyze Ethernet and token-ring traffic on WAN links operating at speeds up to 64K bit/sec.

It is designed to complement, rather than compete with, existing wide-area protocol analysis products used to examine lower level protocols and perform tasks such as bit error rate testing. By comparison, WAN/Synchronous Sniffer Analyzer examines Layers 4 through 7 of the Open Systems Interconnection model.

> It is designed to complement existing wide-area protocol analysis products.
>
> ▲▲▲

Protocol support

The LAN protocols the device can monitor when they are transmitted over wide-area X.25 and Systems Network Architecture links are the same as those supported by existing Sniffer products, such as Apple Computer, Inc.'s AppleTalk, Digital Equipment Corp.'s DECnet, Novell, Inc.'s Internetwork Packet Exchange (IPX) and Xerox Corp.'s Xerox Network System.

The add-on board supports a choice of RS-232 or V.35 interfaces for connecting to wide-area links at speeds up to 64K bit/sec.

Net managers can use the Sniffer to gather statistics about the amount of traffic generated by node or protocol type, and to examine line utilization and response times.

The product should be useful to network managers because of the increasing amount of LAN traffic carried over WANs, said Rosemary Cochran, a principal at Vertical Systems Group, a consulting firm in Dedham, Mass.

"Many of the WAN managers we've talked to are concerned about that because they're not sure how much traffic that really is," she said. "This would provide a means of keeping track of that."

Sending LAN traffic over WANs increases the complexity of managing the network, according to Greg Cline, program manager for the communications technology service at Information Strategies Group/IDC Wash-

> Net managers can use the Sniffer to gather statistics about the amount of traffic.
>
> ▲▲▲

(continued on page 26)

Ethernet-to-FDDI LAN bridges debut

At INTEROP, BICC unveils stand-alone bridge, Cabletron announces interface card for hub.

By Tom Smith
Senior Editor

SAN JOSE, Calif. — BICC Data Networks, Inc. and Cabletron Systems, Inc. last week announced Ethernet-to-Fiber Distributed Data Interface local-area network bridges at the INTEROP 90 Conference and Exhibition here.

BICC unveiled the ISOLAN 1420 FDDI/802.3 Managed Bridge, a stand-alone device that connects a single Ethernet to an FDDI backbone, while Cabletron rolled out the Ethernet to FDDI Media Interface Module (EFDMIM), an FDDI interface card for its Ethernet LAN hub.

BICC's FDDI bridge has an attachment unit interface port that enables it to attach directly to a thick Ethernet or through a transceiver to Ethernets based on fiber optics, thin coaxial cable, or shielded or unshielded twisted-pair wire.

Customers can use the standalone bridge, for example, to link Ethernet users supported by BICC's existing ISOLAN EtherConnect System LAN hub to an FDDI net.

BICC's bridge translates Ethernet packets into FDDI-compatible packets. Because the packets and data are in FDDI format, the BICC bridge can interoperate with other FDDI bridges that have the same translation capability.

This technique is more advanced than encapsulation, in which Ethernet packets are wrapped in an FDDI packet for transmission over an FDDI net. Encapsulation requires the same vendor's bridge on the sending and receiving ends.

Encapsulation also prevents Ethernet users from communicating with end users attached directly to the FDDI ring. BICC's bridge, on the other hand, will enable Ethernet users to communicate with users tied directly to FDDI backbones.

The ISOLAN 1420 can be managed using the company ISOView system, a DOS-based network management product that uses

(continued on page 26)

Auspex Unix superserver supports up to 50 users

SANTA CLARA, Calif. — Auspex Systems, Inc. last week announced a lower end version of its Unix superserver that can support half the number of users as its existing high-end server.

Like the NS 5000, the new NS 3000 file server is based on a VME bus and supports multiple Motorola, Inc. 68020 microprocessors dedicated to specific tasks such as network, file system and disk access functions.

The principal difference is that the NS 3000 supports as many as 50 users on four Ethernets, whereas the NS 5000 supports a maximum of 100 users on eight Ethernets.

Supports TCP/IP, NFS

The server is equipped with 16M bytes of main memory, expandable to 48M bytes, and can accommodate a maximum of 10G bytes of disk storage on five Small Computer System Interface channels.

The NS 3000 file server, which runs the Sun Microsystems, Inc. SunOS version of Unix, supports Transmission Control Protocol/Internet Protocol and Sun's Network File System.

In addition, the lower end server has two expansion slots that accept VME-compatible interface cards.

Pricing for the NS 3000 begins at $89,900.

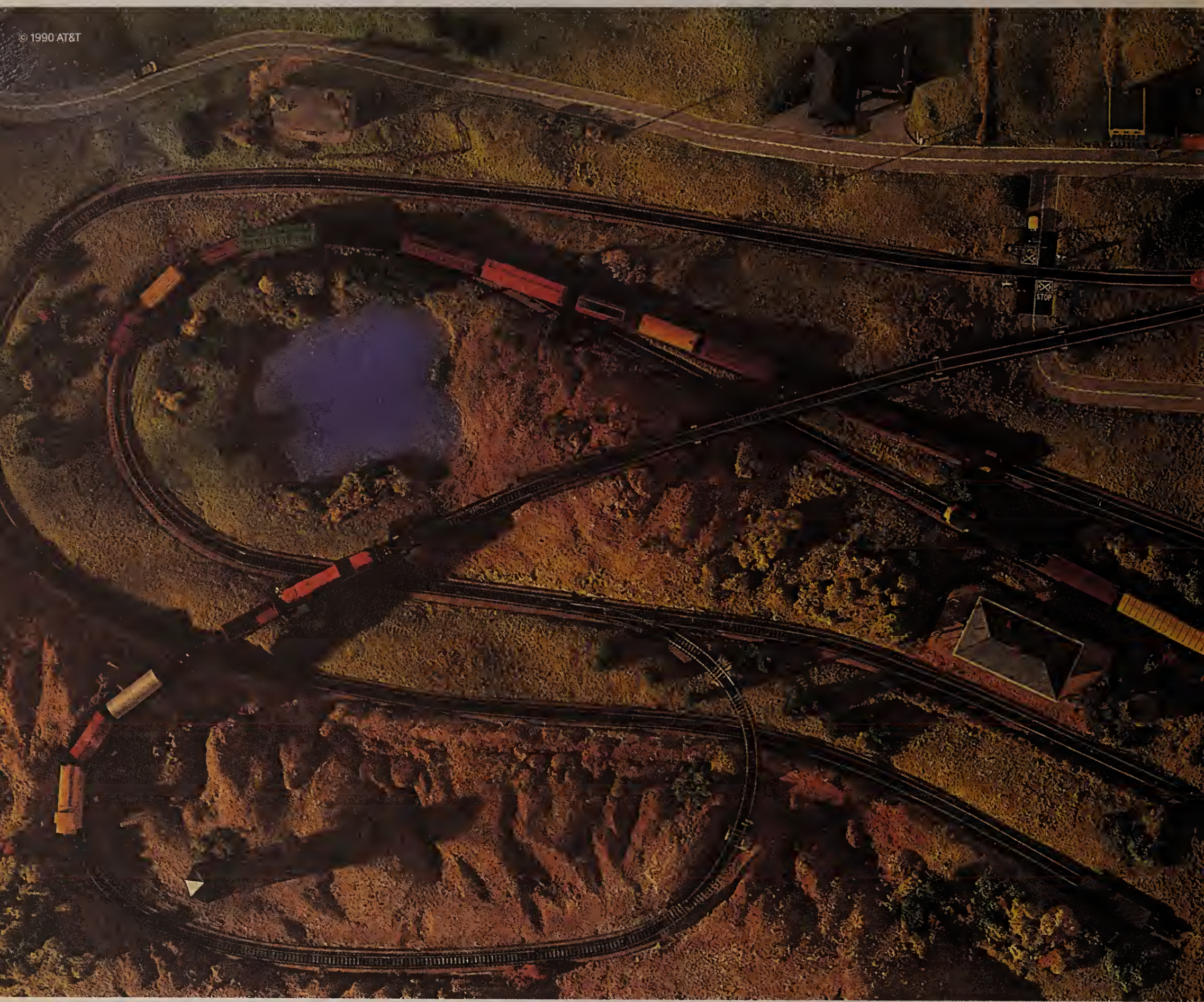
The file server will be available 45 days after receipt of an order.

FDDI server interface

In addition, Auspex said it will offer a server interface to 100M bit/sec Fiber Distributed Data Interface local-area networks by the first quarter of 1991.

Pricing for the interface, which will be offered for both the NS 3000 and the NS 5000, has not yet been set.

The company said it will offer FDDI support primarily because users want that long-term capability, even though few are actually implementing it today, according to Dick Bush, who is vice-president of marketing at Auspex.



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Sniffer gets WAN link for SNA, X.25 nets

continued from page 23

ington, Inc. in Vienna, Va.

"Going from LANs to WANs introduces a lot more variables and a lot more configurations, and makes the task more difficult," he said.

A foreseeable problem

One potential drawback is the 64K bit/sec ceiling the product supports. "Right now, most of the market is in these lower speeds, but that's going to be shifting over the next several years," Cochran said. The ability to support higher speeds "would obviously open up the market to more potential users," she said.

Harry Saal, president of Network General, said the product would be upgraded in response to user needs.

WAN/Synchronous Sniffer Analyzer is available as an upgrade for the company's existing Series 300 Sniffer, which is based on a Toshiba America, Inc. T3200SX portable computer, and the Series 500 Sniffer, which is based on a Compaq Computer Corp. Portable 386.

The upgrade costs $5,000 for the interface card, while the software for SNA and X.25 costs $995 per protocol.

To purchase a Series 300 or Series 500 configured with the LAN and WAN protocol analysis functionality costs $21,750 and $29,000, respectively.

The WAN/Synchronous Sniffer Analyzer is available now.

Ethernet-to-FDDI LAN bridges debut

continued from page 23

the 802.1 protocol, a precursor to the Simple Network Management Protocol (SNMP).

The bridge is expected to be available in December for $22,500.

Cabletron's new bridge, the EFDMIM, is an interface card that plugs into the company's Multi-Media Access Center (MMAC) hub, an Ethernet wiring concentrator. EFDMIM is the first Ethernet-to-FDDI bridge developed for use in a LAN hub, Cabletron said.

Ethernet nodes supported by the hub communicate with the bridge over the backplane of the MMAC. EFDMIM encapsulates Ethernet data for transmission across an FDDI ring to other Cabletron bridges.

By January 1991, Cabletron said it will enhance the bridge to support the translation technique used in the BICC product. Current users will receive a free upgrade.

EFDMIM can be managed using Cabletron's LANview network management system, which is offered in DOS and Unix versions, both of which support SNMP.

The bridge costs $19,995 and is available 60 days after an order is received.

Ethernet-to-FDDI bridge comparison

Vendor: BICC Data Networks
Product: ISOLAN 1420 FDDI/802.3 Managed Bridge
Key features:
- Stand-alone unit
- Links one Ethernet to FDDI backbone
- Translates data from Ethernet to FDDI format

Price: $22,500
Available: December 1990

Vendor: Cabletron Systems
Product: Ethernet to FDDI Media Interface Module
Key features:
- Integrated into Cabletron's LAN hub
- Links one Ethernet to FDDI backbone
- Encapsulates Ethernet data in FDDI format

Price: $19,995
Available: 60 days after receipt of order

SOURCES: BICC DATA NETWORKS, INC., WESTBOROUGH, MASS., AND CABLETRON SYSTEMS, INC. ROCHESTER, N.H.
GRAPHIC BY SUSAN J. CHAMPENY

Netnotes

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R16, a 4M/16M bit/sec token-ring interface for its line of internetwork routers. The $6,700 CSC-R16 is based on the Texas Instruments, Inc. token-ring chipset and supports a single 4M or 16M bit/sec token-ring local-area network. It is available 90 days after receipt of order.

The company also promised to launch in the second quarter of 1991 a higher performance 4M/16M bit/sec interface based on the IBM Token-Ring chipset. That board will support multiple Token-Ring LANs and forward a substantially higher number of packets per second than the TI-based board.

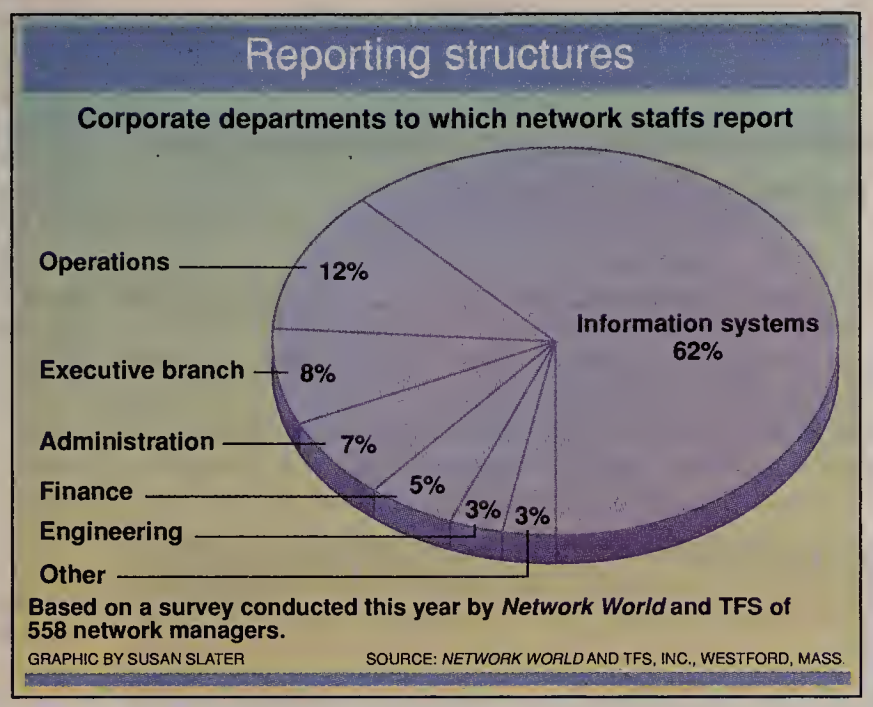
Pricing for the IBM-based Token-Ring interface has not been finalized. Cisco Systems already offers a 4M bit/sec token-ring interface based on the TI token-ring chipset.

AT&T Computer Systems last week announced that NCR Corp. has become the sixth company to license AT&T's LAN Manager/X Server, a Unix-based version of Microsoft Corp.'s LAN Manager local-area network operating system. NCR said it would incorporate AT&T's technology into its own NCR LAN Manager/X offering for the NCR System 3000 family of Micro Channel Architecture-based computers. NCR said AT&T's implementation of LAN Manager/X will provide support for the LAN Manager application program interface set endorsed by X/Open, a consortium of vendors trying to develop a common application environment. AT&T's server offering is specifically tailored for operation within the Unix System V Release 4 environment.

Worth Noting

"Technology people don't have a full understanding of their company's objectives or strategic plans."

Dale Browning
President and
chief executive officer
Colorado National Bank
Denver



Hughes jets through red tape via E-mail

New routing system helps aircraft maker move documents through management ranks quickly.

By Wayne Eckerson
Senior Editor

LONG BEACH, Calif. — Hughes Aircraft Co. recently developed an electronic mail utility that is speeding the distribution of documents that need the approval of multiple managers in different locations.

Introduced this summer, the Electronic Routing and Approval (ERA) system has cut from 10 days to three the time it takes managers to sign off on some forms. Unlike paper-based routing, ERA leaves behind an extensive audit trail and enables users to check the status and location of a particular document at any time.

"So far, most managers agree that ERA is helping them do their jobs more effectively and efficiently," said Peter Donaghy, manager of customer services and the support laboratory at the aerospace firm here. Donaghy directed the team that developed ERA.

ERA runs on top of Hughes' existing integrated E-mail network, which links 20,000 Hughes employees in more than 270 buildings in the Southern California region. The network interconnects proprietary E-mail systems from Digital Equipment Corp., Hewlett-Packard Co., IBM and a variety of local-area network vendors.

The document route

ERA consists of a data base of documents or approval forms residing on a server attached to Hughes' E-mail network. All ERA documents are routed to the server via a Soft-Switch, Inc. gateway, which reformats and distributes all messages sent on Hughes' E-mail network.

Currently, ERA is being used to route eight types of documents to Hughes managers for approval. These include time sheets, registration forms for training classes, and requests to access corporate computer systems from off-site locations and to

(continued on page 28)

Association Watch

SynOptics Communications, Inc. is forming a worldwide user group and plans to host the group's first conference Nov. 5 and 6 at the Doubletree Hotel in Santa Clara, Calif.

The conference will provide users with information about the company's strategy and product directions. It will also explore industry topics such as connectivity, internetworking and network management.

Doug Gold, director of communications research for International Data Corp., will be the keynote speaker. SynOptics executives will discuss market trends and the company's sales, marketing and customer support operations.

There is no charge to attend the conference, which is for users only. For more information, call (415) 691-7174.

The AUTOFACT '90 Conference and Exposition will be held Nov. 12 to 15 at the Cobo Center in Detroit.

A variety of systems and processes for computer-integrated manufacturing will be demonstrated, including computer-aided design and manufacturing, process control and electronic data interchange.

Sponsored by the **Society of Manufacturing Engineers,** the conference will feature more than 150 industry experts speaking at technical tutorials and forums.

The cost of the conference is $350 for one day, $525 for two days, $675 for three days and $800 for all four days.

For more information, call (313) 271-0777.

User group success hinges on vitality of leadership

Execs, consultants detail other key ingredients.

By Maureen Molloy
Staff Writer

Strong leadership is the key element in building and maintaining a productive user group, according to network executives and consultants who have been involved in organizing and running user groups.

In addition, user group insiders say successful groups need a clear, common vision of organizational goals, motivated members and a solid educational foundation.

But "without strong leadership, nothing else will work, even if you have all the other ingredients," said Michael Bailey, president of the Apple Professional Exchange, Inc. (APX), a 500-member group of Apple Computer, Inc. product users that promotes partnerships among vendors, corporations and educational institutions. "And those leaders must then clone themselves and develop more leaders."

Consultant Robert Sullivan, president of Technovation Training, Inc. of Toledo, Ohio, has developed a workshop designed to build the leadership and management skills of people heading upward in a user group or those interested in starting one.

"Many people in the networking field, while having superb technical expertise, lack good management skills," Sullivan said. "Sharing expertise is largely what user groups are all about, so it's important that these people get together in a productive group."

Bailey hired Sullivan to run a workshop at last spring's MacWorld Expo to help APX managers develop better leadership skills. One of the more pressing issues they face, he said, was the problem of ineffective meetings.

Sullivan said the best way to ensure an effective meeting is to know your audience.

"Group leaders must know their members and plan their meetings accordingly," he said. "People join user groups to get information, so you've got to provide them with speakers and projects they'll be interested in."

Sullivan said the meeting must also have a clearly defined goal and a rigid schedule.

Another key to user group success is getting members involved.

"If a handful of people are doing all the work, you're not going to have much of a user group," Sullivan said. "If no one responds when you ask for volunteers on a certain project, you've got to be persistent. Members will have more enthusiasm for a group if they're actively involved."

"Leaders must clone themselves and develop more leaders," APX's Bailey said.

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And lastly, Sullivan said, a successful user group meeting is one that members enjoy attending.

"Members come to meetings for educational and business reasons, but they also want to feel entertained," Sullivan said. He added that this could be accomplished in a number of ways, such

(continued on page 28)

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Relocating spouses. More than half of U.S. companies are helping the spouses of transferred employees find new jobs.

That's according to a recent report by The Conference Board, an international, nonprofit management research group based in New York.

According to the report, about 70% of American couples are dual wage earners, making it more difficult for employees to relocate to new jobs. As a result, many employees are demanding that companies offer relocation assistance for spouses.

"Relocation assistance has become a very competitive issue, and companies are now motivated by their own strategic interests [to offer such a service]," said Arlene Johnson, director of The Conference Board's Work Force Program.

Time off for thought. Computer and electronics firms have the best record when it comes to granting employees sabbaticals and leaves of absence.

That's according to a recent survey of nearly 1,000 human resources professionals by Adia Personnel Services, an employment agency based in Menlo Park, Calif.

Thirty percent of the high-technology firms surveyed offer employees sabbaticals, the study said. Moreover, 60% of the high-tech firms that grant sabbaticals provide employees with full salaries during their time away from the company.

Nationwide, about 10% of companies offer employees sabbaticals to pursue personal or professional interests, according to the survey.

Companies in the West and Northeast are more likely to offer sabbaticals than companies in the Midwest and Southeast, the survey found.

Hughes jets through red tape via EDI

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check out materials from the corporate library.

When managers log on to E-mail, a message appears that tells them an ERA document is pending that needs their approval. Without leaving their E-mail application, managers can call up the document, which appears in the same format as any other E-mail message they receive, no matter what proprietary E-mail system they are using.

The system then presents managers with a menu of four options: They can approve the document, reject it, defer action on it or add another person to the list of people who need to sign it off.

Any action a manager takes is automatically recorded in the ERA data base.

If the manager approves the document, ERA sends it to the next person on the distribution list. If the document is rejected, ERA automatically sends an E-mail message to the person who initiated the document. It tells the sender which manager rejected the document and why.

Donaghy estimated that a year from now, ERA will support hundreds of applications, or approval forms, and will significantly improve the company's internal work processes.

> Donaghy estimated that a year from now, ERA will support hundreds of applications.
>
> ▲▲▲

Today, ERA is available to about 2,500 Hughes employees, specifically those who use IBM Professional Office System and HP's HPDesk E-mail systems, Donaghy said.

In the next year or so, ERA will be expanded to accommodate users on other proprietary E-mail systems.

To accelerate the proliferation of ERA applications, Donaghy's group has published application program interfaces that systems specialists in different divisions or departments can use to write their own ERA approval forms.

Donaghy said users can write applications that route documents between people, from applications to people, or between applications.

Once applications are written, ERA provides a great deal of information about work processes and work flow that can be used to streamline operations, Donaghy said.

For example, an analysis of ERA statistics may show that certain managers almost always approve certain types of documents. These managers could be eliminated from the distribution list or sent only documents that seem to be exceptions to the norm. Either way, Hughes would be able to speed up the work flow and save managers' time, Donaghy said.

Origins

Donaghy's group began looking into developing a routing and approval system in 1988 after a number of senior executives expressed dismay about the slowness with which documents made their way throughout the firm.

The group first talked with a variety of suppliers and user companies to see if such an application already existed. When they came away empty-handed, group members decided to build their own system that would leverage Hughes' existing integrated E-mail network.

Now more than 20 users and suppliers that are familiar with ERA have asked Hughes whether it intends to package and sell the system to other companies, Donaghy said. While the idea is intriguing, Hughes currently does not have plans to market ERA, he explained.

"We're not in the business of selling things," Donaghy said. "We just want to get [ERA] up and running in full production."

User group success hinges on leadership

continued from page 27

as holding the meeting or conference in an attractive setting and providing members with other amenities.

The Tele-Communications Association, Inc. (TCA), a 28-year-old user group for network managers, is one organization that has followed the formula for user group success.

John Dinan, the Colorado chapter director of the 2,000-member TCA, attributes the longevity and size of TCA primarily to a string of strong leaders who have taken pains to get members involved.

"The people who began TCA knew how to get people involved, solicit volunteers and build enthusiasm," said Dinan, who noted that TCA's membership started with six companies in 1962 and has grown to more than 1,000 companies today. "The group is also a valuable educational resource in that members regularly pick one another's brains for new information and ideas at our monthly chapter meetings and at an annual conference."

Worth Noting

There are approximately 477 million central office switches providing network services around the world. Of those, 130 million are in the U.S., followed by 51 million in Japan, 30 million in the Soviet Union and 29 million in Germany, according to Munich, Germany-based Siemens AG.

World News

Last week, former **Nippon Telegraph and Telephone Corp.** Chairman Hisashi Shinto was convicted of accepting bribes as part of the wide-ranging Recruit influence peddling scandal that last year rocked the Japanese government and eventually led to the resignation of the country's prime minister, Noboru Takeshita.

The 80-year-old Shinto was sentenced to two years in prison and fined $170,000 for his part in the scandal. The prison term was suspended, however, because of Shinto's age and what the court described as his "past contribution to the business world."

Recently, Rosemont, Ill.-based **Covia Partnership** announced that Japan Air Lines Company, Ltd. will use the reservation company's Inside Link system to hook its computers into Covia's Apollo reservation net.

The Inside Link system lets the Apollo net directly access Japan Air Lines computers to pull down flight availability and seating information. Nearly 60 car rental, hotel and airline companies use Inside Link to let the Apollo network access reservation information directly from their computers. Without Inside Link, Covia must wait for car rental firms, hotels and airlines to download reservation data updates.

Metromedia/ITT to expand calling card to 20 countries

Will use Executive Telecard to provide service.

By Barton Crockett
Senior Editor

SECAUCUS, N.J. — Metromedia-ITT Long Distance recently said it will use a new service from Executive Telecard, Ltd. to extend the reach of its Preferred Calling Card to 20 countries.

By the first quarter of next year, travelers will be able to use their Preferred Calling Cards to place direct-dialed, local or international calls, which are billed back to their Metromedia-ITT Long Distance account. Executive Telecard hopes to sign similar arrangements with banks, travel companies and carriers abroad so callers can use their credit or calling cards to bill calls.

Countries where the Executive Telecard service is available include Germany, Japan, Switzerland and the U.K.

Callers access the service by dialing into customized Executive Telecard processors via toll-free numbers. These processors use voice prompts to walk callers through the process of entering telephone numbers and calling card or credit card personal identification numbers used to pay for calls.

According to Mark Holofcener, Executive Telecard's vice-president of sales for North America, Metromedia-ITT is the first carrier to use Executive Telecard's service to extend the reach of a calling card.

Analysts said the Executive Telecard service surpasses international calling card services from AT&T, MCI Communications Corp. and US Sprint Communications Co.

Unlike calling card services from these three carriers, users

(continued on page 64)

Pacific Machinery forges link from Hawaii to Guam

By Barton Crockett
Senior Editor

WAIPAHU, Hawaii — Pacific Machinery Co. recently installed a 56K bit/sec private line between its offices here and in Guam that is significantly improving voice and data communications.

The Hawaii-to-Guam link has given Pacific Machinery employees in Guam direct access to warranty, maintenance, inventory and accounting applications and data bases residing on an IBM System/38 minicomputer in corporate headquarters here, according to Roger Staehle, manager of data processing for the company, which is an independent distributor of heavy machinery for Caterpillar, Inc.

Previously, employees in Guam had to call headquarters or send a facsimile requesting information stored on the host. Providing on-line access to data speeds transaction processing and improves customer service, Staehle said.

The digital link has also eased reliance on costly international switched services. Previously, employees in Guam limited the number of calls placed to offices here to reduce dial-up expenditures.

Pacific Machinery is using RLX-8 multiplexers from Republic Telcom Systems Corp. to break the 56K bit/sec line down into one 19.2K bit/sec data channel and four voice circuits.

Staehle said the 56K bit/sec line was cut over May 24 and runs on undersea fiber-optic cable facilities. He said the 56K bit/sec link to Guam costs about $5,000 per month but reduces expenditures on switched services by approximately $2,500 per month.

Pacific Machinery spent about $11,000 to install new terminals, controllers and printers in the Guam office and about $40,000 on the two RLX-8s that support the link, according to Staehle.

The company hopes to install a satellite-based 56K bit/sec link from here to Caterpillar's data center in Peoria, Ill., during the first quarter of 1991, he added. That link would enable Pacific Machinery employees in Guam and Hawaii to access inventory and shipping information, among other data.

Currently, Pacific Machinery employees can only access the Peoria data center via dial-up links.

Staehle said the lease for the satellite link from Hawaii to Peoria would run either $3,150 or $4,100 per month, depending on the satellite dishes the company uses. The link is expected to reduce expenditures on international switched voice and data services by $3,600 per month.

Going private

Years in which countries expect to sell all or part of their national carriers to investors:

Central and South America		**Eastern Europe**	
Argentina	1990	Hungary	1991
Mexico	1990	Czechoslovakia	1992-1993
Puerto Rico	1990	Poland	1992-1993
Venezuela	1991	**Middle East**	
Columbia	1992	Israel	1991-1992
Brazil	1993	Saudi Arabia	1992
Paraguay	1994	Turkey	1992-1993**
Western Europe		**Africa**	
Portugal	1990*	South Africa	1991-1992
Sweden	1991	Kenya	1992
Ireland	1992	Nigeria	1992
Netherlands	1992	**Southeast Asia and Pacific**	
Denmark	1992-1993	Malaysia	1990
Belgium	1993	New Zealand	1990
Germany	1994-1995	Singapore	1991
		South Korea	1991-1992

*** Domestic carrier only.**
**** Privatization was expected in 1991, but the current Middle East conflict will probably delay sale by at least one year.**

SOURCE: TELECOMMUNICATIONS RESEARCH CENTRE, WEST SUSSEX, U.K.
GRAPHIC BY SUSAN J. CHAMPENY

Investors may cast wary eye on PTTs

Rash of privatization plans may leave some PTTs without suitors, stalling planned service upgrades.

By Maureen Molloy
Staff Writer

Governments worldwide are increasingly looking to privatize their post, telegraph and telephone monopolies as a way to improve communications services or raise money, but experts question whether there is enough available capital to sustain all of the sales.

Telecommunications monopolies are viewed by many as a safe and usually profitable investment, but some observers warn that a glut in the market will leave some PTTs without takers. They say too many telecommunications authorities are coming up for sale at once and sellers are competing for limited capital against other attractive investment opportunities. What's more, some PTTs are seen as a bad risk for investors.

"What was once a seller's market has quickly changed into a buyer's market. Investors are becoming much more selective," said Jack Stockdale, chief of research at the Telecommunications Research Centre in West Sussex, England.

The developing countries that could benefit most from privatization are the ones that will have the most trouble finding buyers, Stockdale said. "There just isn't that kind of money around so only the most advanced PTTs that can produce the quickest return on investment will capture investors' interest."

Currently, 27 countries are looking at partial or complete privatization of their telecommunications authorities (see graphic). Stockdale estimates the total investment in these privatizations would be in excess of $145 billion.

Tom Watts, a principal at Booz, Allen & Hamilton, Inc. in New York, said existing telephone companies have traditionally been the primary investors in foreign PTTs. He acknowledged that these companies are becoming more selective in their investments but said new investors will provide enough capital to fund privatizations.

> "What was once a seller's market has quickly changed into a buyer's market."
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"Phone companies don't have enough money to act as sole financers. But many companies outside of the telecommunications field have shown strong interest in PTT investment," Watts said. "Everyone wants a part of this because once it reaches maturity, a phone company becomes a license to print money."

Some nontelecommunications companies that have invested heavily in PTT privatizations include British Aerospace, Inc., Hutchison Whampoa, Ltd., Mitsubishi Consumer Electronics America, Inc. and Motorola, Inc.

(continued on page 32)

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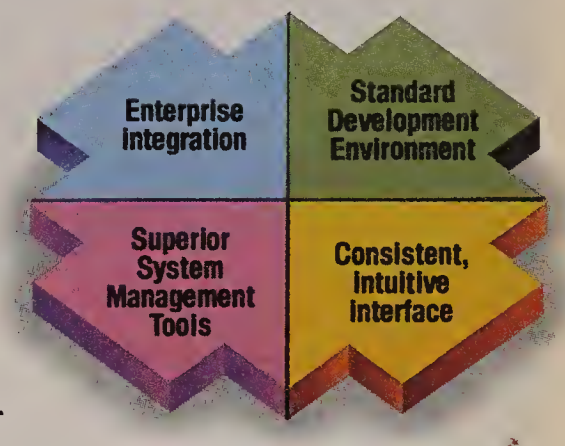

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Investors may cast wary eye on PTTs

continued from page 29

Leonard Elfenbein, president of Little Falls, N.J.-based Lynx Technologies, Inc., which aids major companies in building international networks, said many nations are privatizing PTTs in the belief that removing government control will bring lower prices and better service to users. Other countries see privatization as a way to reduce foreign debt or upgrade primitive networks.

"Privatization has been shown to be the most effective way to develop high-quality services," Elfenbein said. "It's also a way for countries that lack capital to turn the development of their phone systems over to the private sector."

Bill Dixon, head of corporate finance at PaineWebber International, Ltd. in London, said many Western telecommunications companies — particularly the U.S.-based regional Bell holding companies — are eager to invest in PTTs because of restricted expansion in their home market.

"Since U.S. phone companies are restricted from entering certain other domestic markets and they're sitting on a lot of surplus cash, they're highly motivated to invest in overseas PTTs," Dixon said.

But Hunt Lambert, executive director of strategic planning for U.S. West International, Inc., said governments will have trouble unloading their PTTs because of the growing number of investment opportunities available. PTTs will be competing with the privatization of other utilities such as energy and water, as well as with free-market opportunities developing in Eastern Bloc nations and other potential investment areas.

Stockdale said most countries are trying to promote privatization, following the lead of other countries where privatization proved successful.

The U.K. passed legislation shortly after the divestiture of AT&T that permitted the privatization of British Telecommunications PLC and opened up competition in switched services. Soon after, the Japanese government sold off a portion of its national carrier, Nippon Telephone & Telegraph, Ltd., to private investors and authorized competition in switched, dedicated and value-added services, both nationally and internationally.

In 1989, New Zealand introduced one of the more progressive regulatory structures in the world, dropping most barriers to competition with the country's dominant carrier, Telecom Corp. As part of that plan, Ameritech and Bell Atlantic Corp. were permitted to acquire 90% of the carrier. A consortium of vendors led by MCI Communications Corp. is now planning to establish an alternative carrier there.

Experts say that with privatization, users can expect to enjoy an improved network infrastructure and a wider range of services. Often, when governments privatize carriers, they lessen the extent to which revenues from business services are used to subsidize residential services in order to make the carriers more attractive to investors. This means that business users tend to benefit from privatizations by having their network bills lowered.

"What has happened in the U.K. since they privatized is a trend worldwide — local rates are going up, and small companies and residential users are paying more while large business customers are paying less for service than they did before privatization," Dixon said.

> PTTs will be competing with other utilities, as well as with free-market opportunities in Eastern Bloc nations.
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Except for those countries whose geographic size and population are too small to support competition, Stockdale said most countries will consider privatization because a vibrant economy requires a healthy telecommunications infrastructure. But he said the quality of a nation's current network is the key factor in PTT investment decisions today. Those countries with poor telephone networks are precisely the ones investors are likely to avoid.

The sale of Argentina's PTT is held up as an example of a risky PTT investment. In an effort to eliminate a large portion of its $65 billion in foreign debt, the country is looking to sell part of its network to private investors. The network is outdated, debt-ridden and requires major capital investments in addition to the initial outlay for a stake in the company.

Privatization efforts hit a snag last week when Manufacturers Hanover Corp. failed to provide the $2.2 billion in funding needed to finance Bell Atlantic's purchase of half the company. Some say banks holding Argentine debt were reluctant to risk taking an equity stake in what is regarded as a poor telecommunications company.

Singapore, on the other hand, is seen as a country that will have little trouble finding buyers and commanding a top price when it markets its PTT next year. The nation's network is technologically advanced and has high customer usage.

With a population of 2.7 million, Singapore enjoys the world's highest international calling rate at 22 calls per person annually. In addition, more than 600,000 of the country's one million lines are digital, with full digitization planned for 1994.

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Xylogics introduces two FDDI controllers

Xylogics, Inc. last week announced two Fiber Distributed Data Interface controllers for VMEbus computers.

The company's CV3890 and CV4890 each comprise a single VMEbus board with two custom processing chips, a Reduced Instruction Set Computer microprocessor and an FDDI. The CV3890 supports connection of a workstation to an FDDI ring, while the CV4890 links a workstation to two fiber-optic rings for redundancy.

Both models are based on the company's Universal Bus Silicons, which are highly specialized application-specific integrated circuits that sustain a data transfer rate of 35M byte/sec across the VMEbus. This enables a workstation to keep up with FDDI's 100M bit/sec line speeds. The CV3890 and CV4890 cost $8,995 and $10,995, respectively. Both are available now.

Xylogics, Inc., 53 Third Ave., Burlington, Mass. 01803; (617) 272-8140.

Emulex servers allow access to TCP/IP nets

Emulex Corp. recently announced a software upgrade for its Performance line of communications and print servers, including support for popular routing and network management protocols.

Emulex announced support for the Simple Network Management Protocol and the Serial Line Interface Protocol, which will enable personal computer and workstation users to access a Transmission Control Protocol/Internet Protocol or Digital Equipment Corp. Local Area Transport network via the Emulex communications servers.

The company also bolstered its rlogin connection service for TCP/IP networks and added a Unix-like command line interface. The rlogin enhancements pass terminal-specific information to a host. The software upgrades will be available for the Emulex P4000 terminal servers, as well as the P3000 and P8000 print servers.

Emulex Corp., 3545 Harbor Blvd., Costa Mesa, Calif. 92626; (714) 662-5600.

Sun unveils cost-saving print wares

By Charles Bruno
Assistant Managing Editor

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. recently unveiled new software and printers that provide low-cost print services to Unix workstation users on an Ethernet local-area network.

Sun's introduction of its NeWSprint strategy is designed to give users an alternative to expensive printers that have a high degree of built-in intelligence. Using NeWSprint software, users can instead install low-cost printers that rely on Sun's Reduced Instruction Set Computer-based servers and workstations to perform file formatting and page imaging.

In announcing NeWSprint, Sun unveiled NeWSprint software and a SPARCprinter to fill out the strategy. Sun also announced that NeWSprint can operate with printers from 12 of the industry's largest printer and plotter suppliers, including Epson America, Inc., Hewlett-Packard Co., Versatec Corp. and Xerox Corp.

> "It doesn't reinvent printing standards. It makes them more available across a net."
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Under the NeWSprint strategy, Sun workstations are empowered to control print functions while also processing other tasks with a minimum of performance degradation, according to Wayne Rosing, vice-president of Sun's Desktop Systems and Graphics Group.

"NeWSprint leverages the CPU, memory and network capabilities of the SPARCstation," Rosing said. "It doesn't reinvent printing standards; it makes them more available to a wide range of users across a network."

The heart of the company's new print strategy is its NeWSprint software, which resides in Sun SPARCstation and SPARCserver units.

The software controls all functions on attached printers. It performs page imaging via a software-based PostScript-compatible interpreter bundled with the company's Network-extensible Window System (NeWS).

Sun said that redirecting page image processing to a workstation or server provides several advantages. NeWSprint enables any output device connected to an Ethernet to produce high-quality, PostScript-compatible output. Printers that work in tandem with NeWSprint can output PostScript nearly twice as fast as current PostScript printers.

Also, the company said, as server and workstation processors become more powerful, print speeds via NeWSprint will increase. By contrast, if users of traditional printers want to increase print speeds, they often must replace the printer, sacrificing previous font and hardware investments.

The other half of Sun's announcement was the introduction of SPARCprinter, which provides twice the speed, better print resolution and packs more fonts than the Sun LaserWriter II it is replacing. SPARCprinter leverages the processing power of a SPARCstation or SPARCserver to print a maximum of 12 pages per minute, even on jobs with complex graphics or multiple fonts, Sun said. By contrast, many current PostScript laser printers pump out only two to three pages per minute.

The printer offers a software-selectable resolution of 300 to 400 dots per inch and employs a high-bandwidth interface that enables it to support fast print speeds. SPARCprinter is attached to a SPARCstation via an SBus interface card.

Citicorp is testing whether the new products can speed up printing of customer transactions. "We really need speed," said Jungbo Yang, a technical manager at Citicorp. "With PC printers, printing bit-mapped graphics is extremely slow," he said, adding that many laser printers are hampered by the warm-up time needed to print the first page.

"Currently, to get speed, we have to buy high-volume printers that are usually huge and expensive. And we don't have a high volume to print; we have high-speed, low-volume requirements, and there are no printers made for that."

Yang said Sun's SPARCprinter pumps out bit-mapped images 20 to 30 times faster than Hewlett-Packard Co. and Apple Computer, Inc. laser printers.

NeWSprint software costs $495. SPARCprinter, which ships with NeWSprint software, an SBus card, interface cables and a user license, costs $2,695. Both products are scheduled to ship before year end.

Sun Microsystems can be reached by writing to 2550 Garcia Ave., Mountain View, Calif. 94043, or by calling (415) 960-1300.

Wyse intros X-based terminal and server

Company's WY-X5 terminal, 80486 Unix server mark entry into nascent X Window System mart.

SAN JOSE, Calif. — Wyse Technology last week entered the X Window System market with the introduction of an X Window terminal and an Intel Corp. 80486-based Unix server that supports the X Window standard.

The WY-X5 terminal is based on a Motorola, Inc. 68020 microprocessor, can be configured with as much as 5M bytes of memory and has a 17-in. high-resolution monochrome display (1,280 by 1,024 pixels).

It comes with an Ethernet interface and supports Version 11, Release 4 of the X Window standard and a range of net protocols including the Transmission Control Protocol/Internet Protocol.

Wyse said the WY-X5 is compatible with all X Window-based graphical user interfaces, such as Sun Microsystems, Inc.'s OpenLook and the Open Software Foundation's Motif. Setup menus enable users to access configuration parameters, diagnostics and network statistics.

The terminal, which includes a mouse and keyboard, costs $1,799 and is scheduled to be available in the first quarter of 1991.

The new server, the Series 7000i Model 740, is the first product in a new family of devices designed to fill in the middle of the company's line of Unix-based multiuser systems.

The machines, which complement Wyse's low-end Series 5000i and high-end 9000i, can be used with multidrop interfaces to support directly attached terminals or they can be configured as servers in Ethernet environments to support X Window client applications.

The scalable Model 740 will support one to four Intel 80486 microprocessors offering a performance range of 27 million to 160 million instructions per second. The machine is based on a 64-bit asynchronous Wyse Wyde Bus and has an Extended Industry Standard Architecture (EISA) bus for peripherals.

When it begins shipping in December, the 740 will only support a single 33-MHz 80486 microprocessor, but by mid-1991, it will be possible to add three additional 80486 CPUs to a single machine, the company said.

The 740 is based on True Symmetric Multiprocessing technology, meaning the system gives us-

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Telebit unwraps TCP/IP router for Ethernet nets

By Jim Brown
Senior Editor

SAN JOSE, Calif. — Telebit Corp. last week introduced a TCP/IP router capable of forwarding traffic from an Ethernet to remote stand-alone microcomputers over dial-up lines or to a remote Ethernet over a 56K bit/sec dedicated link.

Telebit's NetBlazer supports a full suite of Transmission Control Protocol/Internet Protocol software, including the File Transfer Protocol, which enables remote devices to exchange files, and the Telnet virtual terminal protocol, which enables remote terminals to access different hosts.

NetBlazer comprises a chassis with six interface slots that support any mix of as many as three Ethernet boards, a single V.35 interface supporting attachment to a 56K bit/sec circuit or a maximum of three 8-port RS-232 interfaces supporting connection to as many as 24 modems. The chassis has two additional RS-232 ports that enable NetBlazer to support a maximum of 26 modems.

NetBlazer receives TCP/IP traffic from a local Ethernet, examines the destination address and either routes the traffic over a digital line to a remote Ethernet or establishes a dial-up link to a remote DOS-based microcomputer or an Apple Computer, Inc. Macintosh running TCP/IP software. To create the dial-up connection, NetBlazer converts the TCP/IP destination address to a telephone number, which is passed to the modem for dialing.

NetBlazer is expected to ship next month and has a starting price of $2,995, which does not include modems.

Telebit can be reached at 1315 Chesapeake Terrace, Sunnyvale, Calif. 94089, or call (800) 835-3248 or (408) 743-4333.

OPINIONS

OSI

BY ANDREW DE MARI

Interoperability gains momentum in the net race

Interoperability through Open Systems Interconnection has made great strides and gained worldwide acceptance. The availability of OSI products and the growing number of OSI installations has made interoperability a reality in the corporate and government sectors.

Significant progress has been made in the OSI transport mechanism for the personal computer local-area network environment; second-generation high-performance implementations with small memory requirements are now available for both DOS and OS/2. These implementations offer significantly higher performance levels than Transmission Control Protocol/Internet Protocol and approach the speeds of highly optimized proprietary implementations. Hundreds of thousands of OSI LAN nodes have been installed, primarily in Europe, and are operating productively at major corporate sites, paving the way for a complementary level of interoperability at the transport layer. For example, Ing. C. Olivetti & Co., S.p.A. has installed more than 200,000 OSI LAN nodes.

> OSI is picking up where TCP/IP and other interim solutions leave off.
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OSI is used at large corporate sites worldwide. In the banking environment, for instance, the Deutsche Bundesbank of Germany has installed an electronic clearing network, based on File Transfer, Access and Management (FTAM), that facilitates file and record access and transfer between the bank's departments, as well as between the bank and other financial institutions worldwide.

To some extent, OSI has followed a path similar to that of TCP/IP. For example, TCP/IP was originally espoused by a group of academicians but became widely popular only when it was adopted by the government. Today, both the U.S. and U.K. governments have mandated procurement of OSI-based products. France, Germany, Norway and Sweden have implemented OSI procurement procedures as well through the *European Procurement Handbook for Open Systems* or equivalent procedures. All of this activity suggests that widespread deployment of OSI is inevitable.

Recent events show that OSI is picking up where TCP/IP and other interim solutions leave off. Witness the growth of the INTEROP show from a small engineering-oriented conference demonstrating TCP/IP products to a large, influential trade show now focused primarily on OSI offerings.

Furthermore, the impressive OSI interoperability demonstrations at CeBIT in Hannover, Germany, are growing (more than 40 major vendors participated in 1990), validating the technical feasibility of applications such as electronic data interchange and open document architecture over X.400 and X.500 in realistic business scenarios. As far as interoperability and conformance are concerned, there exists today a sufficient infrastructure worldwide, as well as the facilities and tools to provide reliable and comprehensive services to validate OSI implementations.

TCP/IP is largely an American innovation. In Europe, Japan and other parts of the world, OSI research far exceeds research efforts for TCP/IP or other proprietary solutions. As we move toward a single, European market in 1992 and witness the OSI movement within the U.S., it is clear that OSI is the key to remaining competitive in the 1990s.

De Mari is the founder, chairman and chief executive officer of Santa Monica, Calif.-based Retix, a leading supplier of OSI products.

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EDITORIAL

No states' rights necessary in enhanced services

That the U.S. is one nation, indeed an indivisible nation, was settled 125 years ago in the Civil War. Americans still have a fascination with that war, as the massive audience that watched the public television series *The Civil War* last month surely demonstrates.

It's worth noting, therefore, that states' rights, one of the issues that caused the Civil War, is still hot. In fact, a troubling states' rights issue has recently arisen in telecommunications.

In June, a federal appeals court in San Francisco ruled that the Federal Communications Commission's Third Computer Inquiry decision usurped the authority of state regulators over enhanced services.

Unfortunately in this case, good law — a strict interpretation of the Communications Act of 1934 — leads to bad policy. It's one thing to have 51 ways of administering ordinary voice telephone services (one each for the 50 states and the District of Columbia), but enhanced services are very different from voice connections. Such services include the now-under-test Bell operating company-provided information services gateways.

Here's where local and national needs diverge. National information services must use the local gateways as their distribution tool. Add the FCC, and you have 52 varieties of regulation that could thwart the national interest in making such services easy to use, readily available and as inexpensive as possible.

Furthermore, if the San Francisco ruling is upheld, there would have to be both federal and state Open Network Architecture proceedings, some telecommunications lawyers say. Under the court's strict interpretation of the Communications Act, states also have a right to administer equal access proceedings.

There must be an appeal or an amendment to the act. For, unless this case is clarified, U.S. enhanced services will remain in limbo. So far, the FCC is temporizing. It has announced that it will initiate new proceedings, which may clear up some of the appeals court's questions of fairness but not the fundamental question of states' rights. Delay only adds to the confusion. The FCC must act, and since the Supreme Court might uphold the appeals court ruling, its best course would be to proceed directly to the next session of Congress and ask for an amendment to the act.

The Communications Act of 1934 is almost 60 years old, and its original framers could not have foreseen enhanced services and the threat to national information services that state regulation of them would cause. The act must be changed. There can be no states' rights over enhanced services.

OPINIONS

REGULATORY POLICY

BY ALAN PEARCE

MFJ restrictions force the RBHCs to invest overseas

This past August, U.S. District Court Judge Harold Greene gave his blessing to Ameritech and Bell Atlantic Corp.'s purchase of Telecom Corp. of New Zealand without requiring the New Zealand-based telephone company to divest itself of international long-haul services and facilities.

This is not the first time the judge has approved a regional Bell holding company's multinational business venture. In February, he granted a Modified Final Judgment waiver to Pacific Telesis Group to take less than a 10% interest in International Digital Communications, a Japanese telecommunications group.

Indeed, Greene — whose primary task in the telecommunications industry is to oversee the Modified Final Judgment — has seldom objected to an RBHC venturing overseas to do business.

Ironically, however, Greene has not deviated from his contention that the RBHCs should be severely limited in their business activities and should focus on local telephone service within their regions. This emphasis makes Greene a major force in the RBHCs' compulsion to invest overseas.

Limited growth areas

The RBHCs can provide local exchange services, local cellular telephone services, as well as yellow and white pages directories. They can also install, maintain and market customer premises equipment.

But because of the Modified Final Judgment's line-of-business restrictions, the RBHCs are prohibited from offering information services and they cannot manufacture any equipment, including customer premises equipment. Is it any wonder that the RBHCs have ventured into the world at large?

Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C.

Many critics are saying that the RBHCs should concentrate on improving their regional networks because the telecommunications infrastructure is so valuable to America's continued economic success.

These critics also oppose the RBHCs' overseas investments and acquisitions, and they are advocates of the line-of-business restrictions that tend to push the RBHCs to invest overseas. In short, their public policy positions are inconsistent.

For their part, the RBHCs say they want to invest in their own regional networks but that the Modified Final Judgment's line-of-business restrictions and the political power of their opponents and competitors to keep them out of the newly emerging information services sector are forcing them to think globally.

> The Modified Final Judgment has distorted business investment decisions for too long.
>
> ▲▲▲

The result is ludicrous. Unless things change soon, the RBHCs will invest billions of dollars overseas instead of at home, and these billions will be used to upgrade the telecommunications infrastructures of other countries. This is not necessarily bad, but it is probably not what the RBHCs would choose to do if freed from the business constraints of the Modified Final Judgment.

The Modified Final Judgment is almost 7 years old, and it has distorted business investment decisions for too long. It has stifled competition at home, denied the public of potentially valuable new services and weakened America's international leadership in the telecommunications industry. It is now giving the RBHCs incentives to invest overseas.

At stake is whether the RBHCs can become not only powerful regionally, but also nationally, with some control over their own business destinies.

Fighting for their rights

It seems odd — even un-American — that the RBHCs should have to fight to establish themselves as national business entities. The Modified Final Judgment placed severe restrictions on them because of antitrust law violations, and these restrictions are accompanied by tough Federal Communications Commission and state public utility commission regulations that limit the RBHCs' costs, revenues, prices and profits.

Some time this fall, Greene may rule to allow the RBHCs to offer yellow pages directory services electronically on their networks and also to unleash the companies into potentially lucrative information services markets.

When, and if, this happens, the RBHCs will begin to look inward, not outward. They will have their hands full right here at home.

If Greene really wants to encourage the RBHCs to focus on their local networks and if this is deemed to be in the greater national interest by the public policymakers in Congress, then the RBHCs can easily be encouraged to keep their investment at home.

The most effective way to encourage the RBHCs to focus on their local networks is to abolish the Modified Final Judgment's line-of-business restrictions pertaining to information services and perhaps even equipment manufacturing.

The U.S. telecommunications infrastructure is a vital national asset owned and controlled, for the most part, by the RBHCs. If our public policymakers want to protect and upgrade it, then they must give the RBHCs some encouragement — now, before it's too late.

LIKE ALLIGATORS IN A SWAMP, unforeseen problems can really put the bite on a communications operation. Many managers find themselves wrestling with these networking reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, assistant features editor, at (508) 820-7413, or fax your idea to us at (508) 820-3467. Alligators should be 1,200 words in length and submitted either on disk or via modem.

TELETOONS

BY FRANK AND TROISE

LETTERS

Not so new twist

I read with interest your coverage of Racal InterLan's "new twist" ("Racal InterLan wiring hub doubles as terminal server," *NW,* Oct. 1). According to the article, the company plans to offer a single hub that supports standard Ethernet technology and provides asynchronous terminal server capabilities.

But Ungermann-Bass, Inc. of Santa Clara, Calif., developed, maintained and shipped this new twist more than two years ago when it introduced the Access/One intelligent wiring hub in January 1988. In fact, Ungermann-Bass has shipped more than 140,000 asynchronous terminal ports for the Access/One since its introduction.

The Access/One intelligent wiring hub was the first comprehensive managed network delivery system. It integrates not just Ethernet technology and asynchronous terminals but also 3270 terminals, Apple Computer, Inc. Macintoshes and personal computers; traditional token-ring and Fiber Distributed Data Interface networks; as well as shielded and unshielded twisted-pair wiring, coaxial and fiber-optic cable.

Today, Ungermann-Bass supports some of the world's largest enterprise networks (more than 10,000 nodes) with the Access/One intelligent wiring hub.

Simply put, no other vendor provides the breadth of connectivity in a single managed platform that Ungermann-Bass' Access/One offers.

While the Racal InterLan announcement is interesting and validates our approach of integrating terminal servers with basic Ethernet connectivity, it certainly is not a new twist.

Roger Bertman
Vice-president of marketing
Ungermann-Bass, Inc.
Santa Clara, Calif.

Network World *welcomes letters from its readers.*

Letters should be typed and double-spaced. Send to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

The hands on the clock were yesterday. A museum of And as the Hula-Hoop® Reg. T.M. of Kransco *impending doom closed burst into the small large metal switching And I said in a voice turn into a Nehru then, above the hiss of "Relax. You bought an you expand, up to 90% Investment protection . . . be yours." And as I drove I felt good because life, after*

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waving good-bye. . . . I cleaned the garage obsolescence. Go-go boots and lava lamps. settled around my ankles, this feeling of in on me like night. So I rushed to work, room most people avoid and stared at this device sitting there Buddha-like in the dark. soft as a prayer, "Don't get old on me. Don't jacket. Grow. Expand. 30,000 lines." And the air conditioner, I heard this voice say, AT&T DEFINITY® System. I'm modular. As of my hardware can stay the same. ISDN...virtually limitless growth. It can all the Rambler home, the 8-track boomed and all, is just choices.

FEATURES

THE AGE OF THE ELECTRONIC STAMP

The U.S. Postal Service is taking a cautious approach to using EDI for transmitting business documents.

By KRIS HERBST

For corporations that mail out countless business documents daily, EDI may mean an end to the days of stuffing envelopes and licking stamps.

Electronic data interchange is being positioned to play an important role in the future operations of the U.S. Postal Service. As evidence, the Postal Service recently embarked on its most ambitious and highly visible EDI project to date: electronic transmission of the postage statements that newspaper and magazine publishers must submit with each of their mailings using EDI standards over value-added networks (VAN). Chicopee, Mass.-based Dow Jones & Company, Inc., publisher of *The Wall Street Journal,* and Reader's Digest Association, Inc., based in Pleasantville, N.Y., have joined the Postal Service in a pilot project to demonstrate this technology.

Growing like crazy

The postage statements that magazine and newspaper publishers alone submit to the Postal Service "easily number in the millions per year," according to Rosemary Hamel, general manager of the Postal Service's Classifications Systems division. The number of postage statements submitted for all classes of mailings is expected to grow dramatically if the Postal Rate Commission approves the Postal Service's current proposal for new postal rates and regulations.

Under the current system, mailers deliver computer-generated, hard-copy postage statements to the Postal Service. Postal Service staff members then enter certain data from the forms into systems for financial and operational reporting.

Using EDI to automate this process will cut costs for both mailers and the Postal Service, Hamel says.

"From the mailers' point of view, handling paper statements is costly, time-consuming and cumbersome," she says. "From our perspective, as the number of statements continues to grow, so do our costs, so there is great opportunity here to contain costs on both sides of the equation."

Once details of the current pilot project are finalized, mailers will translate their postage statement data to EDI format and then transmit it across a VAN to a Postal Service electronic mailbox.

"The Postal Service may maintain one or several mailboxes on different networks, depending on what mailers choose to use," Hamel says. The Postal Service will poll the mailboxes, downloading mailers' data and sending notification back to them that their data has been processed and that a corresponding value of postage has been debited from their advance deposit accounts.

Adopting an EDI system for

(continued on page 42)

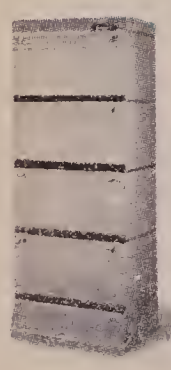
Herbst is a free-lance writer based in the Washington, D.C. area.

9:45 P.M. Welcome. This is Guest Messaging. You received one call before you checked in. Message one: "John, this is Ted. They moved our meeting up to 8:30. I'm not sure where, yet. I'll call you in the morning to let you know." *10:00 P.M.* "I'd like a wake-up call for 6:00 A.M. And can you put a Do Not Disturb on my phone? Thanks."

10:06 P.M. We're sorry, room service is now closed. You can place a breakfast order by pressing 3. 

"I'd like two eggs, over easy, with bacon. Make sure the bacon's crispy. Toast, lightly buttered. Freshly-squeezed orange juice. And coffee, black. To room 235 at 6:15 A.M." *6:00 A.M.* Good morning. This is

THIS GUEST'S STAY DEMANDS



Meridian 1 Communication Systems To handle all these various calls and features, Northern Telecom's Meridian 1 Communication Systems works with a hotel's Property Management System—the computer application that manages all hotel guest transactions. And frankly, ordinary PBXs just aren't smart enough to do this.

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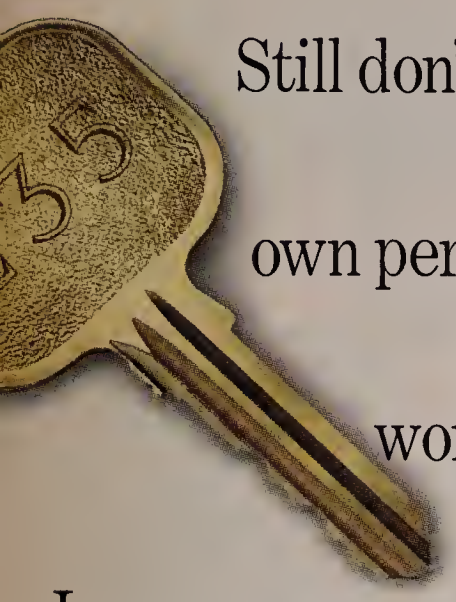
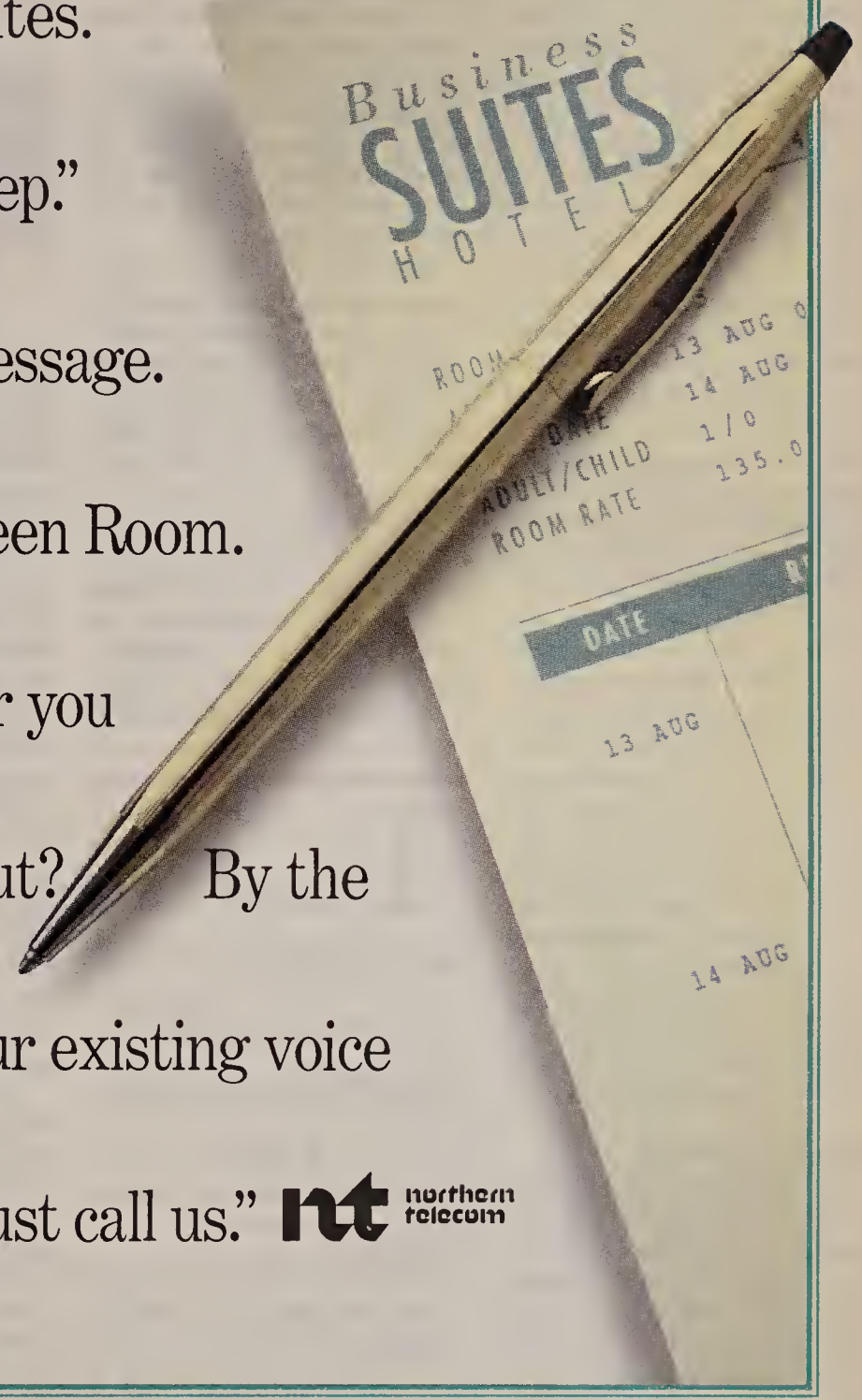
your wake-up call. You have one new voice message. Message Message one: "John? Ted again. Don't forget to bring the revised contract to the meeting. Still don't know what room we're in." *7:00A.M.* To record your own personal greeting, press 7. 7PRS "I just went down for a quick workout. I'll be back in a few minutes. Leave your message at the sound of the beep."

7:20A.M. You received one new voice message.

Message Message one: "John, we're in the Green Room. See you there at 8:30. Oh, and that fax number you need is 555-4473." *8:00A.M.* "Checking out? By the way, Mr. Siebert, if you need to hear any of your existing voice messages, you can access them for 24 hours. Just call us." nt northern telecom





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NORTHERN TELECOM

TECHNOLOGY THE WORLD CALLS ON

(continued from page 39)
postage statements has taken on an air of urgency because the Postal Service recently filed for a rate change that allows third-class mailers to save money by breaking up large mailings and taking them to several post offices, referred to as entry points, rather than mailing everything from a single point. This method is more efficient because materials destined for a particular region can be mailed from an entry point within the region.

However, because mailers must file a separate postage statement and maintain separate postage accounts for the mail processed at each entry point, the amount of paperwork and associated costs required for postage statements mounts as the number of entry points increases. This postal rate is already in effect for second-class mailers, but its use "has begun to grow very quickly in the last year," Hamel says, and if it is extended to third-class mailers, "it will mean that the number of mailing statements will increase geometrically."

To save mailers the trouble of maintaining postage accounts at multiple entry points, the Postal Service has established a centralized postage payment system that allows them to submit all paperwork and postage payments to a single national trust account at the New York Postal Data Center.

"Mailers have been after us for years to find a way to let them do centralized payment because a very large part of our business comes from mailers who don't like keeping separate accounts all over the country," Hamel says.

"We need to get this EDI demonstration in place very quickly. There are already many second-class mailers waiting to get in. We'd like to be ready with EDI because we see it as the only way we can extend centralized postage payment to a significant number of additional mailers without increasing postal service costs at the same time," Hamel says.

Lots of paperwork

Calculating second-class postage rates for large mailings can generate a lot of paperwork because there are many subsets within the second-class postage classification, each with its own rate. Moreover, a separate statement must be filed for each rate. Postage rates are defined according to factors such as number of pages in a publication, weight, percentage of news vs. advertising, number of pieces in a mailing and how pieces are sorted — for example, by mail carrier, five-digit or three-digit zip code.

Because these factors change from day to day, each edition of a newspaper or magazine has a different postage rate. "Second class is the Postal Service's most complex rate," says Richard Graff, Dow Jones' national distribution manager. "All that data has to be accumulated by subsets to create the postage statement, which says, in effect, this is how much money we will owe for the next mailing we do."

Graff, who also chairs both the Postal Service's EDI Subcommittee and the Graphic Communications Association Postal EDI Task Force, an organization that promotes cooperation between private mailers and the Postal Service, says he first proposed three years ago that EDI be used to transmit postal data.

Successful demonstrations of EDI transmissions between Dow Jones and the Postal Service prompted the postmaster general to add the EDI Subcommittee to the Automation Bar Code (ABC) Group that oversees automation of the Postal Service.

Recent recognition

A few people within the Postal Service recognized the value of EDI from the start, "but it's only in the last eight to 10 months, since the postmaster general assigned this to his ABC group, that it has been more widely recognized," Graff says.

Last year, after the Postal Service contracted with IBM to help set up a demonstration project, Reader's Digest offered to be the beta site for a mainframe-to-mainframe link with the Postal Service, using IBM's EDI software.

"We've always talked about reducing paperwork, so as soon as it was suggested that we take a look at EDI transmission, we jumped right on the bandwagon," says Bernie Schraml, Reader's Digest's production distribution manager.

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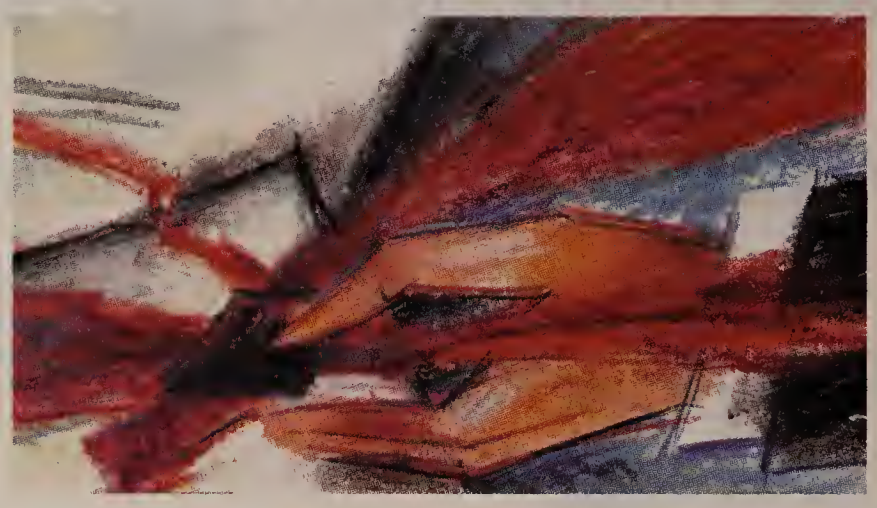
However, IBM's involvement in the pilot project implies no commitment to IBM products in the final EDI system, according to Hamel. "We are using certain products because they facilitate the timing of the pilot project, but one of our primary objectives is to look at EDI software products that address a variety of hardware platforms and to evaluate all of the major VANs as carriers," Hamel says.

After solving some initial software compatibility problems, Reader's Digest transmitted a postage statement to the Postal Service from its IBM 3090 mainframe.

"We transmitted twice last December. Because the transmission was successful, we proved it could be done without any difficulty once you have the software in place," Schraml says. "We are anxious to get over the pilot phase and really get going."

Once an EDI system is in place, Reader's Digest will be able to use it to transmit many of the 1,200 second-class postage statements that it now submits each month at 161 entry points. Backup data, which creates even more voluminous paperwork and is required for mail verification, may be the next candidate for EDI after postage statements are fully automated.

"Mailers produce a lot of documentation to back up their mailing statements," Schraml says. "For now, we produce computer printouts to support a mailing, [which] are given to the postal people who verify the mail. We would like to transmit that information to the post offices on an as-needed basis. For example, if they want to know how many magazines are on a specific pallet, we would rather have them look that up on a data base than provide a 4-ft stack of paperwork, as we did to verify one mailing."



"We also see a real benefit to the Postal Service, because right now they have someone manually reviewing information from the 1,200 postal statements we send in each month, and that's a tremendous burden when you have hundreds of mailers turning in these forms," Schraml adds.

Hamel agrees, noting that an EDI system will "automate the checks that we now do manually so we can eliminate virtually all of the manual checking and very quickly confirm numbers and process final postage amounts."

The Wall Street Journal requires daily preparation of 150 postage statements to determine the amount of postage that Dow Jones owes each day. *"The Wall Street Journal* has the largest daily circulation of any newspaper and is the largest second-class daily publication in the mail," Graff says. "So, 150 postage statements, 22 times per month, is about 3,000 to 3,200 statements each month."

PCs play a role

Dow Jones uses an IBM Personal Computer running OS/2 for its link to the Postal Service mainframe. Using a Personal Computer makes Dow Jones' EDI system easier to implement and more user-friendly, according to Graff. The setup will generate information the Postal Service can use to give mailers the option of using either personal computers or mainframes with their EDI systems. The Postal Service is also testing an MS-DOS product to ensure that all mailer hardware platforms can be handled.

Although it could reduce its software costs by using a personal computer, Reader's Digest has decided to stay with its mainframe. "Some mailers may not be able to justify the purchase of software for a mainframe because of the large expense, and they may prefer to use a PC for transmission," Schraml says.

Some industry experts told Reader's Digest that mainframe software might run from $30,000 to $50,000, compared to $1,500 to $3,000 for personal computer software. However, to download all the necessary information from a mainframe to a personal computer would be too difficult and complex in terms of storage capacity and transmission, according to Schraml. "We prefer mainframe-to-mainframe communications," he says.

Future applications will emerge as a postal EDI system is implemented. Having mailing data available in electronic form will allow mailers and the Postal Service to do more sophisticated analyses of subjects such as the flow of mail through the system, profiles of the mailers using the system and forecasts of Postal Service work loads.

Electronic funds transfer

Electronic funds transfer is not yet part of the Postal Service's EDI pilot project, but it probably will be in the future.

Some mailers already use the technology to transfer money to their postage accounts. "We move the money daily because you must always pay the Postal Service before you do your next mailing," Graff says. This arrangement improves Dow Jones' cash flow and eliminates the need to send multiple checks to a number of locations, according to Graff.

"For a year, our accounts payable department has been sending daily payments to the Postal Service using electronic funds transfer," Schraml adds. "I think that has planted a seed in people's minds: If we use it for postage payment, why can't we do it in other areas? We've really been a trailblazer in showing people how easy it is. It has been a catalyst to show how it can be applied to other areas in our company."

Other large second-class mailers such as Newsweek, Inc. have also expressed interest in transmitting postal data via EDI, according to Graff, as have some third-class bulk mailers and fulfillment houses that serve as circulation and subscriptions clearinghouses for publications that do not have their own mailing operations. According to Hamel, the Postal Service plans to begin a pilot project with a third-class mailer in the near future.

EDI in Europe

In Europe, the incorporation of EDI into postal systems is further advanced than it is in the U.S. The Universal Postal Union, based in Bern, Switzerland, has adopted the EDI for Administration, Commerce and Transport (EDIFACT) standard and will be developing an international EDI system during the next five years.

Unipost International Post Corp. SA, a Brussels, Belgium-based organization formed by postal groups in 21 regions worldwide, including Australia, Canada, Europe, Japan and the U.S., is preparing a European EDI demonstration project that will begin later this year. Ireland's postal service, An Post, is managing the project.

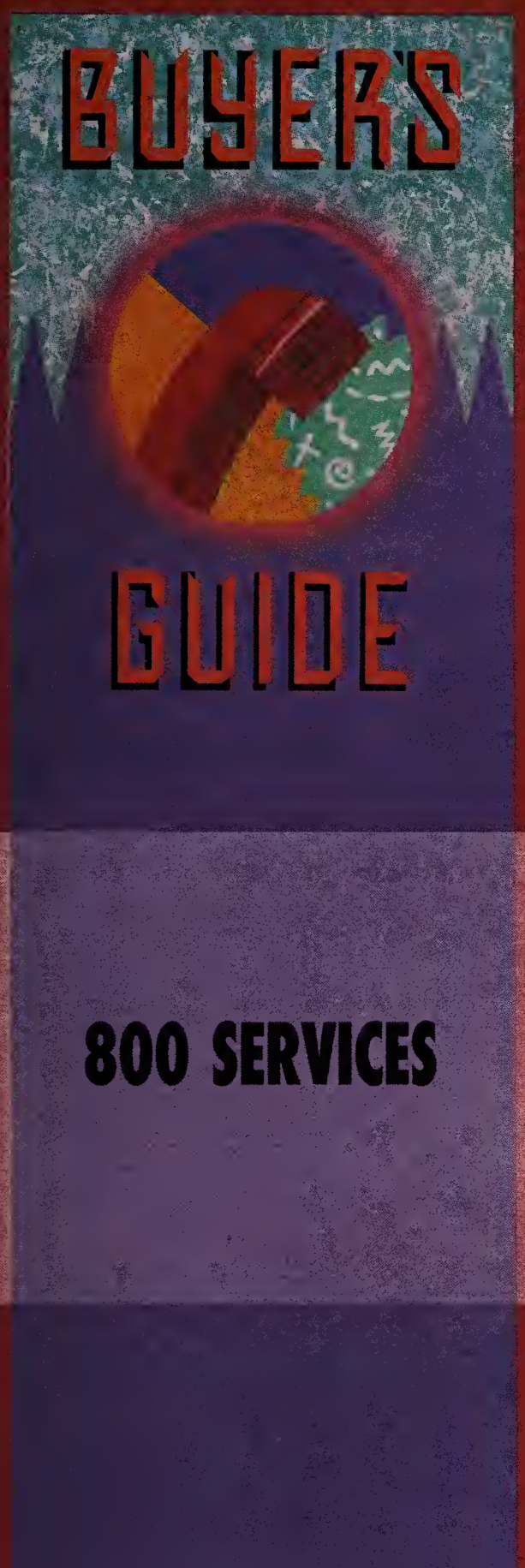
So far, An Post is the only postal service that has gone beyond using EDI for internal purposes by offering an EDI mail service to its customers. An Post's PostGEM EDI service is based on software from AT&T Istel called Electronic Data Interchange Service and uses EDIFACT standards. An Post plans to expand PostGEM to an international service soon, according to David O'Meara, head of An Post's PostGEM unit.

Although An Post competes with private carriers such as IBM and General Electric Information Services, "we hold the largest share of the EDI market in Ireland, by far," O'Meara says. "It seems extraordinary to me that other post offices are so slow and very obvious why we should be in the business. For us, it's a matter of survival. Structured trade documentation comprises a significant part of the mail stream. When our customers' needs and methods change, we adapt with them. Any post office that thinks it can survive today in the long term without electronic services is wrong."

Some administrators within the U.S. Postal Service are beginning to share this perspective, according to Hamel. "I think that as the Postal Service begins to understand EDI, each functional area will look at the opportunity to convert some process so that it is more consistent with the way other businesses are conducting their activities," she says.

In Europe, the incorporation of EDI into postal systems is further advanced.

TELECOM



800 SERVICES

800 services mature rapidly

CONTINUED FROM PAGE 1
portability — their ability to switch carriers and yet retain the original 800 number. This will take some time in coming. Although the Bell operating companies are developing intrastate products based on a new Bellcore-administered data base in Kansas City, Mo., recent rulings by the Federal Communications Commission have pushed the practical rollout date for nationwide BOC data base access — the critical link for number portability — into the late 1990s (see "Why delay a national 800 data base," page 46).

The carriers will continue to use price as a weapon to win customers; they must. When MCI Communications Corp., US Sprint Communications Co. and other interexchange carriers try to win a customer from AT&T, they often have to tempt that customer with at least 5% savings in order to cover the costs the customer will incur to change 800 numbers.

Some carriers such as Advanced Telecommunications, Inc. (ATC), Allnet Communication Services, Inc., Litel Telecommunications Corp., Metromedia-ITT Long Distance and Rochester Communications, Inc. (RCI) offer simpler, less feature-intensive service that also relies heavily on price differentials. RCI, for instance, claims to set its 800 rates at least 10% below MCI's to en-

(continued on page 45)

Briere is president of TeleChoice, Inc., a Montclair, N.J., telecommunications consultancy specializing in long-distance service competitive analysis and network design.

CHART • GUIDE

Buyer's Guide charts detailing dedicated access line termination, WATS access line termination and local line termination methods as well as advanced features for 800 services are on pages 45, 46, 50 and 52.

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NETWORK WORLD

Dedicated access line (DAL) termination method

Carrier	800 service	Target market, hours per month/ dollars per month	Termination method	Pricing method	Originating coverage	Service installation charge	Line installation charge	Central office connection	Access coordination	Monthly service charge	Monthly line charge	Monthly central office connection	Monthly access coordination	Port charge	Special access surcharge	Call rounding/minimum average time requirement
Advanced Telecommunications Corp. Atlanta (800) 226-8888	Laser-EXPRESS 800	100+, $1,200+	T-1, DAL	Flat rate	50 states	None	$450 per T-1, $200 per first DAL, $50 each additional DAL	(7)	(7)	None	(7)	(7)	(7)	None	(7)	6 seconds/ 18 seconds
Allnet Communication Services, Inc. Birmingham, Mich. (800) 783-2020	MarketLine 800	500+, $5,000+	T-1	Flat rate	50 states, Puerto Rico, Virgin Islands	None	(7)	None	None	None	(7)	None	None	None	(7)	6 seconds/ 30 seconds
AT&T Basking Ridge, N.J. (800) 222-0400	Megacom 800 Service (1)	480+, $5,000+	T-1, T-3, DAL	Virtual banded	50 states, Puerto Rico, Virgin Islands, Canada	$1,090	(7)	$310 per T-1, $514 per T-3	$110 per T-1, $2,300 per T-3	$50 per service group	(7)	$62 per T-1, $300 per T-3	$21.70 per T-1, $130 per T-3	None	State-specific	1 second/ 30 seconds
	Nodal Validator 800	480+, $5,000+ (2)	T-1, T-3, DAL	Virtual banded (3)	50 states, Puerto Rico, Virgin Islands	$1,090	(7)	$310 per T-1, $514 per T-3	$110 per T-1, $2,300 per T-3	$50 per service group	(7)	$62 per T-1, $300 per T-3	$21.70 per T-1, $130 per T-3	None	State-specific	1 second/ 6 seconds
Cable & Wireless Communications, Inc. Vienna, Va. (800) 486-8686	EXCEL 800	300+, $2,750+	T-1 (4)	Flat rate	50 states, Puerto Rico, Virgin Islands (5)	None	(7)	None	None	$20 per service group	(7)	None	None	$62 per month	State-specific	6 seconds/ 30 seconds
Litel Telecommunications Worthington, Ohio (800) 837-0004	Macroline 800	500+, $5,000	T-1, DAL	Virtual banded	Ohio, Indiana, Illinois, Michigan, Pittsburgh LATA	None	(7)	None	None	$20 per 800 number	Local telephone company charge per T-1, $90 per DAL	$53 per T-1, $10 per DAL	None	None	(7)	6 seconds/ 30 seconds
	Nationwide 800	300+, $3,000	T-1, DAL	Virtual banded	50 states	$50 (currently waived)	(7)	None	None	$20 per 800 number	Local telephone company charge per T-1, $90 per DAL	$53 per T-1, $10 per DAL	None	None	(7)	6 seconds/ 30 seconds
Metromedia-ITT Long Distance East Rutherford, N.J. (800) 275-6531	800 WATS	500+, $5,000+	T-1, DAL	Virtual banded	50 states	$150	(7)	None	None	First number free; each additional number, $20	(7)	$60 per T-1, $10 per DAL	None	None	None	6 seconds/ 30 seconds
MCI Communications Corp. Washington, D.C. (800) 888-0800	800 services, dedicated termination	300+, $3,000+	T-1, DAL, bidirectional capability also available	Virtual banded	50 states, Puerto Rico, Virgin Islands, Canada and 20 other countries	$50	(7)	$279 per T-1, $176 per DAL	$186 per T-1, $150 per DAL	$20 per service group	(7)	$100 per T-1, $20 per DAL	$21.70 per T-1. $10.55 per DAL	None	State-specific	6 seconds/ 30 seconds
RCI Long Distance Rochester, N.Y. (800) 828-2733	Net 1-800	500+, $5,000+	T-3, T-1	Virtual banded	50 states, Puerto Rico (8)	$50	(7)	None	None	$20 per service group	(7)	None	None	None	State-specific	6 seconds/ 30 seconds
US Sprint Communications Co. Kansas City, Mo. (800) 887-8000	Ultra 800	500+, $5,000+	T-1, DAL (6)	Virtual banded	50 states, Puerto Rico, Virgin Islands, Canada and 6 other countries	None	$1,165 per T-1, $350 per DAL	None	None	$50 per service group	Customer specific (see FCC Tariff 8)	None	None	$5 per active circuit on T-1, none per DAL	$870 per T-1, $36.50 per DAL	6 seconds/ 30 seconds
	Direct 800	200 to 500, $2,500 to $5,000	DAL	Virtual banded	50 states, Puerto Rico, Virgin Islands, Canada and 6 other countries	None	$1,165 per T-1, $350 per DAL	None	None	$50 per service group	$130 per DAL within local distribution area	None	None	$5 per T-1, none per DAL	$870 per T-1, $36.50 per DAL	6 seconds/ 30 seconds

FOOTNOTES:
(1) AT&T also offers Megacom 800 HI-CAP service, which is designed for customers with "peaking" traffic. This is an option of Megacom 800. It allows as many as 7,500 calls per minute to be terminated at the same 800 number. Customers are charged 6 cents per call completed and 3.5 cents for ineffective call attempts for HI-CAP service.
(2) Average call length is 20 seconds.
(3) AT&T surcharges calls 2 cents per call during the daytime period, 1.5 cents during the evening period and 1.25 cents during the night/weekend period. Under AT&T's Guarantee Validator Service, AT&T discounts all charges above $25,000 by 50%.
(4) Provided on case-by-case basis; general availability by 11/90; bidirectional capability also available.
(5) Cable & Wireless has a $50 setup fee and $10 monthly fee for coverage beyond the continental U.S.
(6) Analog access facilities may be used only over T-1 access facilities.
(7) Fee is charged by the local telephone company.
(8) Canada and other foreign origination to start in 1991.

This chart includes a representative selection of carriers in the 800 services DAL termination market. Most carriers offer other DAL termination services, and many carriers not included offer a full range of competitive products.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

(continued from page 43)
courage migration to its own network services.

The emphasis for many users is still on number portability. The local exchange carriers are positioning themselves so they are not left out of the game, despite unfavorable rulings this year by the FCC that effectively delay the BOCs' ability to launch their nationwide BOC 800 data base. Use of such a data base would allow users to keep the same 800 number when switching long-distance carriers.

Earlier this year, U.S. District Court Judge Harold Greene ruled that the BOCs could not use Signaling System 7 (SS7) for trunk signaling across LATA boundaries, thus requiring the BOCs to deploy signaling nodes within each LATA, an expensive move for the BOCs. The BOCs were hoping to install a single SS7 signaling node for multiple LATAs. US West, Inc. is appealing the Greene decision.

If pressed to deploy individual SS7 nodes in each LATA, the practical implementation date for a national data base service becomes late in the 1990s. The BOCs could roll out data base services before that without LATA-wide SS7 deployment, but another ruling by the FCC hinders that as well. The FCC said the BOCs need to have interconnection at the tandem level and at the end office level for 80% of the originating 800 traffic before they can drop the 800 routing scheme, which allocates certain exchanges to each toll-free carrier.

Not to be distracted, some carriers, such as Pacific Bell, Nynex Corp. and Bell Atlantic Corp., and

(continued on page 46)

NETWORK WORLD

WATS access line termination method

Carrier	Product	Target market, hours per month/dollars per month	Pricing method	Originating coverage	Service installation charge	Line installation charge	Monthly service charge	Monthly line charge	Special access surcharge	Call round-ing/ MATR
AT&T Basking Ridge, N.J. (800) 222-0400	Masterline	0 to 500/$0 to $5,000	Number Plan Area blocking	50 states, Puerto Rico, Virgin Islands, Canada	None	$266.50	$20 per service group	$36.70	$27.40 per line	1 second/ 30 seconds
	800 Service	100 to 500/$1,200 to $6,000	Virtual banded	50 states, Puerto Rico, Virgin Islands, Canada, 53 other countries	None	$266.50 (1)	$20 per service group (1)	$36.70 (1)	$27.40 per line (1)	1 second/ 30 seconds (1)
	Basic Validator	100 to 500/$1,200 to $6,000; designed for short transmission (2)	Virtual banded (3)	50 states, Puerto Rico, Virgin Islands	$99	$266.50	$20 per service group	$36.70	$27.40 per line	1 second/6 seconds
MCI Communications Corp. Washington, D.C. (800) 888-0800	800 service: Switched WATS Termination	0 to 350/$0 to $3,400	Virtual banded	50 States (4), Puerto Rico, Virgin Islands, Canada, 20 other countries	$50	$150	$20 per service group	$35	$36.25 per line	6 seconds/ 30 seconds

MATR = Minimum average time requirement

FOOTNOTES:
(1) Charges for international service differ.
(2) Average call lengths are less than 20 seconds.
(3) AT&T applies a surcharge of 2 cents per call during the daytime hours; 1.5 cents during the evening hours; and 1.25 cents during the night and weekend period. AT&T will discount all surcharges above $25,000 by 50% under its Guarantee Validator Service.
(4) MCI has a $50 setup fee for extended coverage beyond the continental U.S.

This chart includes a representative selection of carriers' WATS access line termination methods of 800 services.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

(continued from page 45)
some independents, such as GTE Corp., are moving ahead with plans for the development and use of their own 800 access and data base services anyway. These services use the national Bellcore-administered 800 data bases in Kansas City.

At the heart of these 800 plans are complementary 800 services, through which customers can have a true choice of interexchange service — the BOC can receive inter-LATA calls using any participating carrier the customer chooses. The BOCs provide the intra-LATA portion, while the interexchange carriers provide the inter-LATA portion.

The choices can be numerous. Pacific Bell, for instance, allows customers to choose from a list of carriers that includes AT&T, Cable and Wireless Communications, Inc., MCI, Telecom*USA and US Sprint, plus five other regional carriers.

Some of the smaller regional carriers are able to offer their own 800 numbers for the first time through these programs. Instead of reselling other interexchange carrier 800 services, these carriers can load their customer information into the BOC data bases and use their intelligent features and routing capabilities.

In most cases, these capabilities are quite extensive, including call detail reporting, time and day routing features, and advanced call allocation functions.

To date, only Pacific Bell has an operational complementary 800 service in place. Other products are due soon from various local exchange carriers.

Why buy local?

For users, the big question is from whom to buy intra-LATA 800 service — the interexchange carriers or the local exchange carriers. Local offerings have many advantages and disadvantages. Among the advantages are:

■ **Price.** The BOCs are competing heavily on price. For instance, AT&T 800 Readyline intrastate rates are a flat $14.04 per hour in California, regardless of the time period.

Compare that with Pacific Bell's rates that start at $11 per hour and drop to as low as $6 for night and weekend calling. While both Pacific Bell and AT&T have volume discount plans, the AT&T deals are not sufficient to cover these differences in cost. Other interexchange carrier pricing is more competitive with the Pacific Bell rates but not enough to invalidate the premise of price as an advantage.

■ **Instate-only service.** Users that want to restrict calling to state boundaries — perhaps because that is the range of their services — can use the BOC services as a least expensive option. Most interexchange carriers do not have explicit instate-only 800 offerings; users are required to sign up for area code routing features to exclude all area codes outside that state. These interexchange carrier options are expensive — sometimes more than $100 per month. The BOC offerings limit calling to within state boundaries, excluding all calls that may originate outside a customer's service area.

> One notable feature lacking in low-end BOC services is network management.
>
> ▲▲▲

■ **Vanity numbers.** NXX is the exchange portion of an 800 number. For example, in (800) BUY-THIS, BUY is the NXX. Customers that have been waiting to spell certain phrases with BOC-reserved NXXs can now obtain those numbers.

Under the NXX plan, the BOCs were allocated 19 NXXs. To obtain an 800 number that uses one of these NXXs, the customer must sign up for a BOC service and wait until number portability becomes available. This works in reverse as well, however. For instance, if the customer wanted any number beginning with (800) ASK, then Metromedia-ITT would be the only option.

■ **Relationship.** Users that have been dealing with the BOCs for decades may be more comfortable with allowing them to handle 800 traffic.

■ **Number portability.** For at least the inter-LATA portion of the 800 service, customers can switch carriers without changing numbers, subject to local regulatory laws.

Among the disadvantages of local exchange carrier service are:

■ **Advanced features.** Some BOC services offer no features, just competitive pricing. Sophisticated features such as time-of-day or day-of-week routing, or even alternate routing on a regular basis, may not be available from the BOC service.

■ **Out-of-state service.** BOC offerings stop at state lines. Since the national 800 data base is not in effect at this time, customers that want to expand beyond these boundaries must switch carriers — and numbers. This limits a company's growth using the same 800 number.

■ **Single-vendor service.** The customer needing both instate and out-of-state 800 services will receive two bills — one from the BOC and one from the interexchange carrier.

Low end lacks management

One notable feature lacking in low-end BOC services is network management — the ability to self-administer advanced routing and control features. Users of BOC complementary services will have to maintain dual management of their 800 services. The BOCs will not handle customer changes to interexchange carrier-originated features, such as time-of-day routing. These changes must be handled by the customer.

This situation will not change soon. Until the FCC orders full national 800 data base deployment, the BOCs will not be inclined to

(continued on page 50)

Why delay a national 800 data base?

Users are concerned about the Federal Communications Commission's April ruling that tied Bell operating company deployment of a national 800 number data base to availability of Signaling System 7 (SS7) in 80% of the U.S. public network's telephone switches. The FCC made the decision based on what it considered extreme increases in the service quality of 800 number call setup times.

Under the present 800 NXX interim plan, Bell Communications Research allots each carrier a certain amount of 800 number prefixes. Each BOC screens the first six digits of an 800 number to determine which long-distance carrier should handle the call. The entire process of screening and routing the call now takes about seven to 14 seconds.

When SS7 is implemented nationwide, its faster out-of-band signaling will cut the call setup time to an average of five to seven seconds, possibly less in practice.

The problem comes in trying to enact SS7-style call processing without having SS7 fully installed nationwide. The BOCs can start using the national 800 data base for routing 800 calls, but users would see a jump in call processing — probably raising call setup time to between 14 and 21 seconds.

Users familiar with shorter call setup times could get confused, hang up and call again, increasing call attempts and doubling or tripling network traffic. For these reasons, the FCC ordered that the current NXX plan be retained until SS7 has been more fully implemented.

— Daniel Briere

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See The FAXNeT Form on Page 51

NETWORK WORLD

The Newsweekly of User Networking Strategies

Volume 7, Number 9 | An IDG Communications Publication | February 26, 1990

Novell bows to users on Named Pipes

By Laura DiDio
Senior Editor

Facing pressure from users, Novell, Inc. did an about-face last week and promised to deliver Named Pipes for DOS software before year end.

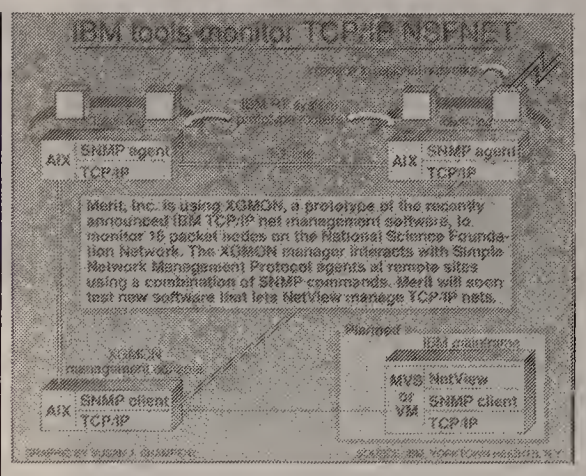
In an interview last month, Darrell Miller, executive vice-president of Novell's software group, said Named Pipes for DOS was "on the back burner due to lack of user demand" ("Top Novell execs discuss strategy," *NW*, Jan. 22). He said only two major users had requested the product, adding, "We won't do it unless we see significant user demand."

But users were quick to react, calling Novell and *Network World* to express their need for Named Pipes for DOS. That user demand was also very much in evidence at the Networld '90 trade show in Boston earlier this month, Miller admitted.

"Based on recent end-user feedback, we've put Named Pipes for DOS back on the front burner and we'll deliver it as soon as possible," Miller said.

Among other functions, the product would enable DOS workstations on a NetWare local-area network to communicate with Microsoft Corp.'s SQL Server, running on a dedicated OS/2 workstation, using the Named Pipes

(continued on page 56)



Prototype of IBM TCP/IP mgmt. tool trialed at Merit

XGMON system enables consortium to manage 16-node T-1 network of IBM switches, routers.

By Paul Desmond
Senior Writer

ANN ARBOR, Mich. — Merit, Inc. is using a prototype version of a recently announced IBM TCP/IP net management product to manage the National Science Foundation Network (NSFNET).

The system, dubbed XGMON, uses the Simple Network Management Protocol (SNMP) to manage a collection of prototype IBM routers and packet switches used as backbone nodes in NSFNET. SNMP is the Transmission Control Protocol/Internet Protocol network management standard.

XGMON is capable of managing any device that supports SNMP, whether it be on the backbone or a regional network supported by NSFNET. For example, Merit uses XGMON to manage regional network routers from cisco Systems, Inc. and Proteon, Inc.

Merit is also preparing to test prototype IBM software that will give NetView native support for SNMP. That software will make it possible for NetView to manage Systems Network Architecture nets and devices on TCP/IP networks that support SNMP.

IBM announced that capability

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FCC weighs plan to ease rules on AT&T

AT&T-sponsored proposal would free carrier from filing tariffs for custom net arrangements.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The FCC is considering a plan to end regulatory oversight of AT&T's custom network arrangements, freeing the carrier to offer such deals through private contracts rather than public tariffs, *Network World* has learned.

The plan, which would cover services currently offered under Tariffs 12, 15 and 16, was formulated by AT&T and may be included in a proposed Federal Communications Commission rule making to be discussed at a scheduled March 8 public hearing.

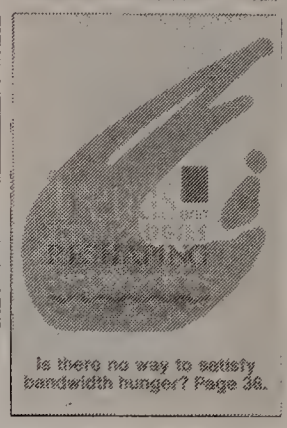
The rule making is expected to outline changes being considered by the FCC for regulating AT&T in light of growing competition in the interexchange market.

William Catucci, corporate vice-president of federal regulatory affairs at AT&T, said the carrier has discussed a plan with FCC officials that would reclassify offerings targeted to large users as non-common carrier services. Currently, all AT&T services are classified as common carrier services, meaning they must be available to all customers under uniform terms and conditions.

Categorizing custom network arrangements as non-common carrier services would enable AT&T to offer them without filing for FCC approval.

"We're hoping that the commission will put this [idea] in their proposed rule making as a possible way of treating competi-

(continued on page 58)



Is there no way to satisfy bandwidth hunger? Page 38.

User builds LAN-based image tool

By Paul Desmond
Senior Writer

QUINCY, Mass. — A mutual fund service company here has built a LAN-based imaging application, based on a prerelease version of IBM's ImagePlus software, that is expected to support the distribution of some 100,000 documents daily by year end.

Boston Financial Data Services, Inc. (BFDS) is using the IBM Application System/400 version of ImagePlus to support its Automated Work Distributor, a work-flow automation system that is expected to boost employee productivity between 30% and 40%.

BFDS maintains mutual fund shareholder accounts — including handling customer inquiries and generating account statements — for 93 mutual fund management companies.

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NETLINE

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FBI PROBE OF US SPRINT threatens the implementation of the FTS 2000 network. Page 2.

INNOVATE VS. AUTOMATE, the secret to gaining a competitive advantage. Page 2.

HOSPITALS EXAMINE the merits of HL7 at an annual health care meeting. Page 2.

US SPRINT PROPOSES rate revisions for its Network WATS and Ultra WATS plans. Page 6.

ISDN PROVES ITS WORTH in production use, living up to trial expectations. Page 6.

SUN'S NFS EXHIBITION shows a wide range of industry support for the network protocol. Page 6.

NEWSPAPER

FEATURE

Today's matrix switches blur product boundaries

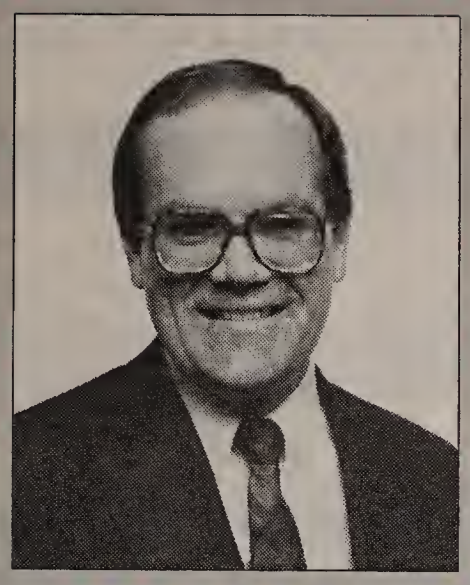
By David Levin
Special to Network World

Once used primarily for bulk port switching among front-end processors, matrix switches today offer extensive network management, T-1 multiplexing and T-1 cross-connection capabilities. These additional features make the matrix switch worthy of a fresh look by network managers.

As the functionality of matrix switches has grown and changed, so has the market. According to a recently completed market survey by New York-based consulting and systems integration firm Netcomm Inc., three vendors lead this market: Ipitex Corp., Data Switch Corp. and Telenex Corp. Next come Codex Corp., Datacomm Management Sciences Inc., Datatran Corp., Dynatech Corp. and Racal Milgo, which resells Telenex's switch.

Data Switch recently caused a stir within the industry by announcing the Liberator, a fiber, satellite unit that con-

(continued on page 43)



Larry L. Ehlers
Manager of Plant Engineering
Bendix/King, General Aviation
Avionics Division, Allied-Signal, Inc.

"Network World's coverage is the most pertinent to our needs. That's why it's the only weekly I always take the time to read."

Headquartered in Olathe, Kansas, Bendix/King General Aviation Avionics Division, a unit of Allied-Signal, Inc., is a major manufacturer of radios and flight instruments for airline, business, military and owner-flown aircraft. To effectively service over 100 airlines, all aircraft manufacturers, and about 700 dealers worldwide, the company relies heavily on its own telecommunications system. A system that's largely the responsibility of Larry Ehlers, Manager of Plant Engineering.

"In addition to overseeing maintenance and construction, I manage all aspects of networking at our five Kansas facilities, including voice, data and videoconferencing. We utilize a T-1 backbone to connect somewhere between 200 and 300 data users and six videoconferencing rooms, while enabling 3,000 employees to access the network. Our videoconferencing capability alone has given us a competitive edge as it enabled us to speed up product development on a new airline collision-avoidance system and beat our competition to the marketplace.

"We're also one of the first to collocate T-1 multiplexing equipment at a U.S. Sprint point of presence. Our savings here have been substantial. We've drastically reduced T-1 access costs, saved about $60,000 a year by gaining free access to the Sprint videoconferencing network, and saved another $10,000 or so annually on voice and data access lines.

"Bendix/King has long been a poineer in certain applications of telephony and networking. And *Network World* is one of our most important information sources. As a weekly, it gives us the latest on product availability, networking trends and industry leaders. And it helps us evaluate offerings from carriers and equipment vendors, playing a major role every time we buy. *Network World's* coverage is the most pertinent to our needs. That's why it's the only weekly I always take the time to read.

"Especially useful to us is *Network World's* ability to digest the vast amount of information continually coming out. With only four professionals dedicated to networking, we don't have time to waste. And since we can't be experts in all areas, we rely on *Network World* for expert coverage of the networking issues and applications of greatest interest to us."

Network World. Its exclusive coverage delivers the most focused editorial on enterprise networking every week. Leading users like Larry Ehlers of Bendix/King understand how today's technologies are shaping tomorrow's business successes. That's why, week after week, *Network World* is their most important information source for helping ensure a competitive edge.

NENT"

NETWORK WORLD

Local line termination method

Carrier	Product	Target market, hours per month/dollars per month	Pricing method	Originating coverage	Service installation charges	Line installation charges	Monthly service charge	Call rounding/ MATR
Advanced Telecommunications Corp. Atlanta (800) 226-8888	Laser-PLUS 800	0 to 100/$0 to $1,200	Flat rate	50 states	$75	(4)	$10 per service group	6 seconds/30 seconds
	Prestige 800	0 to 10/$0 to $100	Flat rate	50 states	None	(4)	$2.50 per service group (3)	1 minute/1 minute
Allnet Communication Services, Inc. Birmingham, Mich. (800) 482-4848	PrecisionLine 800	2 to 10/$20 to $150	Region-specific	50 states, Puerto Rico	$30	(4)	None	6 seconds/30 seconds
	InstantLine 800	10 to 600/$125 to $8,000	Region-specific	50 states, Puerto Rico	$70	(4)	None	6 seconds/30 seconds
AT&T Basking Ridge, N.J. (800) 222-0400	Readyline 800 Service	0 to 500+/$0 to $5,000+	Number Plan Area blocking	50 states, Puerto Rico, Virgin Islands, Canada	$43.50 basic, $50 customized	(4)	$20 per routing arrangement	1 second/1 second (1)
Cable & Wireless Communications, Inc. Vienna, Va. (800) 486-8686	Nationwide 800	0 to 300/$0 to $2,750	Flat rate	50 states, Puerto Rico, Virgin Islands (2)	None	(4)	$10 for Cable & Wireless outbound customers, $15 for stand-alone 800	6 seconds/30 seconds
Litel Telecommunications Corp. Worthington, Ohio (800) 837-0004	Easyline 800	5 to 700/$60 to $7,000	Virtual banded	Ohio, Indiana, Illinois, Michigan, Pittsburgh LATA	None	(4)	$12 per 800 number	6 seconds/30 seconds
	Nationwide 800	5 to 700/$60 to $7,000	Virtual banded	50 states	$50 (currently waived)	(4)	$20 per 800 number	6 seconds/30 seconds
MCI Communications Corp. Washington, D.C. (800) 888-0800	800 Service - Business Line Termination	0 to 5,000/$0 to $50,000	Virtual banded	50 states (5), Puerto Rico, Virgin Islands, Canada and 20 other countries	None	(4)	$20 per service group	6 seconds/30 seconds
Metromedia-ITT Long Distance East Rutherford, N.J. (800) 275-6531	800 Service	0 to 500/$0 to $5,000	Virtual banded	50 states	$50	None	$20 per number	6 seconds/30 seconds
RCI Long Distance Rochester, N.Y. (800) 828-2733	800 Plus	0 to 500/$0 to $5,000	Virtual banded	50 states (6)	$50	(4)	$20 per service group	6 seconds/30 seconds
US Sprint Communications Co. Kansas City, Mo. (800) 887-8000	FONLine 800	0 to 500/$0 to $5,000	Virtual banded	50 states, Puerto Rico, Virgin Islands, Canada and 6 other countries	$50	(4)	$10 per service group	6 seconds/30 seconds

MATR = Minimum average time requirement

FOOTNOTES:

(1) Total monthly bill is rounded up or down to the nearest one-tenth of an hour.
(2) Cable & Wireless has a $50 setup fee and a $10 monthly fee for coverage beyond the continental U.S.
(3) Waived if usage exceeds $10 per month.
(4) Fee charged by local telephone company.
(5) MCI has a $50 setup fee for extended coverage beyond the continental U.S.
(6) Canadian and other foreign origination due this year.

This chart includes a representative selection of carriers that use local line termination for 800 services. Most carriers use other line termination methods, and many carriers not included offer a full range of competitive products.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

(continued from page 46)

put much effort into advanced feature development, especially network management. Luckily for the BOCs, the same is true for the interexchange carriers; they have not placed much emphasis on the low-end management of features.

This leaves low- to mid-range users with little choice in self-maintenance of lines. If they cannot afford or understand the on-site terminal devices marketed by the interexchange carriers for routing and feature control, they must call in changes to a customer service center.

Remote 800 configuration

A prime example of problems with feature control involves trying to change the number to which an 800 number terminates. Suppose a small user wants the 800 number to ring at home instead of the office, or a company decides to have 800 calls answered by an outside answering service after hours. Getting such changes made can take from 30 minutes to five days.

For more immediate changes, some users may opt for using call forwarding in combination with complementary 800 service to enable self-controlled rerouting. Users can dial into their serving central office and reroute inbound calls to another number through standard call forwarding.

Users that have tried this approach have reported several problems, however. First, all calls are forwarded, not just 800 numbers. Second, call setup times can jump to 20 to 25 seconds per call.

With new capabilities and features, some of the smaller carriers are tackling some of these problems. The low- to mid-range market (up to $5,000 per month in telecommunications costs) has always been the major market base for these smaller carriers, so it is important for them to be responsive to the needs of this segment.

> The larger carriers offer premises-based terminal access to network data bases for their larger customers.
>
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Cable and Wireless is taking a novel approach to routing control with its Programmable 800 Service, which is designed to give users control over local line-terminated 800 service. Users can access the Cable & Wireless network via any phone using dual-tone multifrequency (DTMF) signaling.

Programmable 800 uses DTMF commands to work through menus on a voice response unit to reroute an 800 number to a new local line termination. Since the user changes only one line at a time, the program requires no routing tree or routing plan. The cost for the Programmable 800 feature is $10 per month. Metromedia-ITT plans to launch a similar service in the first quarter of 1991.

Routing control services

The larger carriers offer premises-based terminal access to network data bases for their larger customers. Giving the user a window into the interexchange carrier's network enables the manager to decide how and where 800 calls are routed. With these routing control services, users can provide uniform call allocation across inbound trunks, allocate calling between sites for handling efficiency, reroute around emergencies, increase call handling at certain offices for promotions and plan for future 800 usage across their networks — all from on-site management terminals.

Routing control features can be preprogrammed to cover scheduled parameters, such as sending all calls originating between 5 p.m. and 7 a.m. Eastern Standard Time to the 24-hour off-site customer service center. Alternatively, changes can be made on an ad hoc basis in near real time. For example, if a bomb scare shuts down one office, all calls can be routed to another office until further notice.

These changes are made more often than one might think. The

(continued on page 54)

FAXNeT is a service designed to help readers of *Network World* gather important information via FAX on products and services advertised in *Network World*.

How to Use FAXNeT

Listed below in the FAXNeT Directory are the FAX numbers of participating advertisers in this week's issue of *Network World* and the page number where the ad appears. To use FAXNeT cut out the FAXNeT form and make a copy of the form for each inquiry you want to make. Then just FAX it to the vendor's number listed in the FAXNeT Directory.

Benefits to the *Network World* Reader

FAXNeT is designed to get you product and service information FAST. And, if your request is urgent and requires an immediate response from the vendor just check the "Urgent" Box.

This week's FAXNeT ADVERTISERS

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Bell South	47	404-876-9575
Chipcom	26	617-890-6857
Contel/ASC	11	301-251-4407
Digilog	60	215-628-3935
Fujitsu BCS	8	602-921-4800
Hubbell Premise Wiring	18	203-456-3749
NEC BSSD	21	516-753-7683
Tel. Training Monthly	61	215-598-7690
Teletutor	61	603-433-2260
Tri-Data	22	408-980-6565
US Sprint	3	703-689-6998
Williams Telecomm	12	918-588-5110
World Expo	28	508-879-8237

NETWORK WORLD

FAXNeT

Attention: Marketing Communications Manager

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Company/Div _____

Address _____

City _____ State _____ Zip _____

Phone _____ FAX _____

☐ URGENT

Action Requested
- ☐ Request for Sales Call
- ☐ Request for Proposal
- ☐ Request for Information

Purchase Timeframe
- ☐ Within 60 Days
- ☐ Within Six Months
- ☐ Within One Year

Scope of Purchase Responsibility
- ☐ Enterprise Wide
- ☐ Departmental

Purchase Influence/Number of Sites
- ☐ One Site
- ☐ 2-9 Sites
- ☐ 10-20 Sites
- ☐ 21+ Sites

Product Advertised: _____

_____

Intended Application: _____

_____

_____

Advanced 800 service features

Carrier	800 service	Area code routing	Automatic number identification	Band advance	Call allocator	Call attempt profile	Call intercept	Call overflow	Call prompter	Command routing	Exchange routing	Dialed number identification service	800 referral service	Routing control service	Standard area selection	Tailored call coverage	Time and day routing	Uniform call distribution
Advanced Telecommunications Corp. Atlanta (800) 226-8888	LaserPLUS 800	No	No	NA	No	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes		
	LaserEXPRESS 800	No	No	Yes	No	No	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	Prestige 800	No	No	NA	Yes	No	No	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes
Allnet Communication Services, Inc. Birmingham, Mich. (800) 482-4848	InstantLine 800	No	No (1)	NA	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No
	PrecisionLine 800	No	No (1)	NA	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No
	MarketLine 800	No	No (1)	NA	No	Yes	No	No	No	No	No	No	No	No	No	No	No	
AT&T Basking Ridge, N.J. (800) 222-0400	Masterline	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes, only to 800 Routing Control Service II	Yes	Yes	Yes (2)	No
	Megacom 800 Service	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (2) (13)	Yes (10)
	800 Service	No	Yes	NA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (2) (13)	Yes (10)
	800 Readyline	Yes	No	NA	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes, only to competitive 800 services	Yes	Yes	Yes	Yes (2)	No
Cable & Wireless Communications, Inc. Vienna, Va. (800) 486-8686	Nationwide 800	No (1)	No (3)	NA	No (4)	No	No	No	No	Yes, customer programmable	No	No	Yes	No (5)	No (4)	No (4)	No (4)	No
	EXCEL 800	No (1)	No (3)	NA	No (4)	Yes (6)	No	Yes	No	Yes	No	Yes	Yes	No (5)	No (4)	No (4)	No (4)	No (3)
Metromedia-ITT Long Distance East Rutherford, N.J. (800) 275-6531	800 WATS	No (4)	Yes	NA	No	No (4)	No (4)	Yes	No (4)	No (4)	No	Yes	No (4)	No (4)	No (4)	No (4)	No (4)	Yes
	800 Service	No (4)	Yes	NA	No	No (4)	No (4)	Yes	No (4)	No (4)	No	No	No (4)	No (4)	No (4)	No (4)	No (4)	No
Litel Telecommunications Corp. Worthington, Ohio (800) 837-0004	Easyline 800	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes (1) (7)	No (1)	No
	Macroline 800	No	No	Yes	No	No	No	No (1)	No	No	No	No (1)	No	No	No	Yes (1) (7)	No (1)	No
	Nationwide 800 - dedicated termination	No	No	Yes	No	No	No	No (1)	No	No	No	No (1)	No	No	No	Yes (1) (7)	No (1)	No
	Nationwide 800 - local line termination	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	Yes (1) (7)	No (1)	No
MCI Communications Corp. Washington, D.C. (800) 888-0800	800 Service - dedicated termination	Yes	Yes	NA	Yes	No	No	Yes (8)	Yes (1)	Yes	No	Yes	Yes	Yes	Yes (12)	Yes	Yes (13)	Yes (10)
	800 Service - switched WATS termination	Yes	No	NA	Yes	No	No	No	Yes (1)	Yes	No	No	Yes	Yes	Yes (12)	Yes	Yes (13)	Yes (10)
	800 Service - business line termination	Yes	No	NA	Yes	No	No	No	Yes (1)	Yes	No	No	Yes	Yes	Yes (12)	Yes	Yes (13)	Yes (10)
RCI Long Distance Rochester, N.Y. (800) 828-2733	Net-1 800	No (3)	No	NA	Yes	Yes	Yes	No (9)	No (9)	No (11)	No	Yes	Yes	No	Yes	Yes	Yes	Yes
	800 Plus	No (11)	Yes	NA	No	Yes	Yes	NA	No (11)	No (11)	No	No	Yes	No	Yes	Yes	Yes	Yes
US Sprint Communications Co. Kansas City, Mo. (800) 877-6000	Ultra 800	Yes	Yes	NA	Yes	Yes	No (4)	Yes	No (4)	Yes	No (4)	Yes	Yes	No (4)	Yes	Yes	Yes	Yes
	Direct 800	Yes	Yes	NA	Yes	Yes	No (4)	Yes	No (4)	Yes	No (4)	Yes	Yes	No (4)	Yes	Yes	Yes	Yes
	FONLine 800	Yes	No	NA	Yes	Yes	No (4)	No	No (4)	Yes	No (4)	No	Yes	No (4)	Yes	Yes	Yes	No

NA = Not applicable
NPA = Number Plan Area

FOOTNOTES:
(1) Available fourth quarter 1990
(2) Exchange-level routing is available if the customer subscribes to area code routing.
(3) Available second quarter 1991
(4) Available first quarter 1991
(5) Available third quarter 1991
(6) Provided as a special study on request
(7) Limited to exclusion of 1 NPA
(8) Available to any switch in the country
(9) Due first quarter 1991
(10) Feature available to all carriers through local exchange company
(11) Available through Tailored Call Coverage option
(12) Available through Tailored Call Coverage, Time Manager and Day Manager options
(13) Incorporates Day Manager and Time Manager options

This chart includes a representative selection of carriers in the advanced 800 service market. Most carriers offer other advanced 800 service features, and many carriers not included offer a full range of competitive products.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

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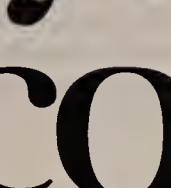

AT&T ISDN is working in Telemarketing:

Even before a telemarketer answers the phone, all account information about the caller can appear on-screen. Telemarketing companies can now give immediate answers to their customers' questions. So orders get processed faster, sales opportunities are greater and customers aren't left on hold listening to music.

AT&T ISDN is working in Transportation:

With AT&T ISDN's Call-by-Call feature, transportation companies are now centralizing control of their dispatch operations and combining various AT&T switched services on the same T-1 pipe. This flexibility means that more calls are being handled with fewer access lines. AT&T ISDN has helped transportation companies save thousands of dollars each month and has moved their businesses into the fast lane.

AT&T ISDN is working in Lodging:

Right now, when their switchboards are all lit up, hotels are using AT&T ISDN to route calls automatically to the next available agent, even if they're in another location. That maximizes their staffing efficiency. Also, with our automatic number identification feature, agents have become more accurate and are saving time, opening the door for more personalized service.

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(continued from page 50)
largest toll-free users generally make 40 or 50 changes daily, both preprogrammed and ad hoc. Midsize users make three or four changes daily, mostly programmed.

The ability to make these changes can be critical to the ultimate success of the 800 application. J.C. Penney Catalog Telemarketing of Dallas has used AT&T's routing control service to drive down the average call answering time to below 10 seconds and to hold its call abandonment rate below 4%.

The Internal Revenue Service will be using US Sprint's 800 routing service control to increase its handling of nationwide calls over its taxpayer assistance 800 lines. For the IRS, timely call completion is of critical importance — people get frustrated waiting for the government and hang up. Losing calls can mean that taxpayers will make errors on their returns, or worse, will not file returns at all, creating more work for the IRS in the long run.

For the IRS, timely call completion is of critical importance.

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■ **AT&T routing control service.** AT&T launched its Routing Control Service (RCS), designed primarily for large users, in 1984. RCS exists in three forms. The most basic is RCS-I, which controls the most elemental functions available under its Features Package I. These include 800 Area Code Routing, 800 Time Manager and 800 Day Manager. Costs for RCS-I are $250 per month for the service, plus $1 per minute beyond one hour of usage.

RCS-II controls the more advanced Features Package II, which includes Features Package I as well as 800 Exchange Routing and 800 Call Allocator. Charges for RCS-II are $500 per month for the service, plus $1 per minute for usage beyond one hour. RCS-Personal Computer Interface (PCI) is an adjunct to RCS-II but uses as access the Accumaster Services Workstation, an AT&T 6386 WorkGroup System microcomputer and software. RCS-PCI costs $500 a month for the service.

The RCS-I and RCS-II services require a workstation for connection to the AT&T net. The RCS operates on a near real-time basis with the routing control system. However, large users can average as much as five hours of on-line time a month, running up usage rates. AT&T designed RCS-PCI for these users. RCS-PCI allows users to perform network configuration off-line and then upload the changes into the system in a burst of data. The PCI option also allows users to analyze network designs and store routing solutions for future applications.

For less sophisticated customers, similar routing control is available through AT&T's Advanced Features Service Center (AFSC), where employees implement changes on a near real-time basis. The AFSC currently supports two features, Command Routing and Quick Call Allocator (see "800 chart definitions," this page, for a more in-depth explanation of these and other features).

These two features work with others to allow quick pre-planned routing control. If not preplanned, changes must go through the service order process, which can take as many as five days.

■ **MCI.** MCI offers its large customers 800 Configuration Management (800 CM) service, a menu-driven system that operates from an IBM 3270-compatible terminal or a personal computer with terminal-emulation software. Access is either dial-up or dedicated. It currently takes an average of five minutes to implement changes. Customers can also program routing solutions and store them for future use.

MCI charges a monthly feature fee of $500 per month. MCI also charges $30 monthly for dial-up access and $225 monthly for dedicated access, plus installation charges of $500 for dial-up access and $1,000 for dedicated access.

MCI has not yet fully integrated 800 CM into its network management platform, the Integrated Network Management System (INMS). Customers can hot-key between INMS and 800 CM, however. Full integration of 800 CM into the INMS graphical interfaces is due later in 1991.

■ **US Sprint.** US Sprint is finalizing its routing control service under its Integrated Network System Interface and Terminal Equipment (INSITE) platform, which is being introduced in four phases. The first phase, INSITE I, allows primitive 800 service management in addition to other service management tasks. INSITE II, scheduled for release to the general public in the third quarter of 1991, allows more complex customer-controlled configuration of multiple services, including 800.

The US Sprint routing control service to be used by the IRS allows management of their 800 network through the INSITE II workstation. The routing control program displays every 800 termination location in the customer network, from the dedicated Ultra 800 to the switched line-based FONLine 800. New locations are added automatically to the system.

The BOCs will face increasing competition for these 800 customers.

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Through a graphical user interface, the user can make changes, either preprogrammed or ad hoc, on a near real-time basis. The user can also set up and store routing scenarios up to two years in advance. US Sprint has designed its system so that the user does not need decision trees or other complex routing instructions to work the system.

Costs for US Sprint's routing control service are not yet tariffed.

The future of 800 services

Most communications managers can translate their routing needs into an algorithm such as, "When X happens, I'll implement Y." The carriers are creating a network environment that offers users a choice of either automatically implementing such algorithms or manually prompting for routing control plans when certain specified network or traffic conditions are encountered. In the manual scenario, users will likely still be prompted with a suggestion, such as "Condition X exists; implement Y?"

Eventually, the premises-based routing control workstation services will work their way down to the middle of the market as personal computer interfaces are developed. Meanwhile, however, users with smaller staffs or lack of sophisticated management capabilities will either call the carrier customer service groups for network changes or will use a dial-up service such as that provided by Cable and Wireless to fulfill their routing needs.

It is important to realize that the interexchange carriers have an incentive not to compete heavily against the BOCs in complementary 800 services because the BOCs absorb all of the sales costs for intra-LATA 800 services. The interexchange carriers realize this and are guarding their relationships with the BOCs closely, to the extent of keeping the BOC customer names from their own sales forces, which would likely try to convert BOC customers to regular interexchange carrier lines.

Whether the BOC complementary 800 services will weather the regulatory storm is questionable at this time. MCI has been protesting to the Department of Justice about the complementary 800 services, claiming that the features offered by the BOCs are enhanced services.

The BOCs are restricted by the Modified Final Judgment from providing enhanced services on inter-LATA calls. Some BOCs, such as BellSouth Corp., are waiting for a waiver of the Modified Final Judgment to be approved before tariffing their complementary 800 services. Pacific Bell, Bell Atlantic and others are moving ahead with their plans now, hoping that a Greene decision will not strike down the services at a later point.

For now, however, the BOCs will face increasing competition for these 800 customers. Certainly, the ability of the BOCs to counter interexchange carrier feature capabilities, such as the advanced routing features or Cable and Wireless' routing control, will be important for users buying instate 800 services as needs and applications become more sophisticated.

800 chart definitions

Selecting an 800 service is sometimes confusing due to the different terms the various carriers use.

Listed below and referenced in the accompanying charts are generic descriptions of the most important features for 800 service.

■ **Automatic number identification,** called INFO-2 by AT&T and 800 ESP by MCI Communications Corp. This feature permits a customer to receive originating number information from the network when the call is placed.

■ **Area code routing,** called point-of-call routing by MCI. This permits the identification of termination points for calls originating from specific geographic areas.

■ **Band advance.** This permits the rerouting of a call to a different 800 service group that encompasses a greater calling area. It applies only to banded 800 services, which carriers are now phasing out.

■ **Call allocator,** called percentage allocation by MCI. This feature permits customers to allocate calls between two or more locations by determining the percentage of calls each location should receive.

■ **Call attempt profile.** This is a summary report that provides detailed information on attempted calls to an 800 number. Data includes number of call attempts by area code, time of day and date of call.

■ **Call intercept.** This enables 800 calls to be answered by a recording in the network.

■ **Call overflow,** called route advance by both AT&T and US Sprint, and direct termination overflow by MCI. This feature permits the rerouting of a call over business lines or other WATS lines when all dedicated 800 circuits are busy.

■ **Call prompter,** called alternate routing by MCI. This permits the caller to listen to a recorded message and enter additional digits for routing to the location of choice.

■ **Command routing.** This feature permits the customer to define preprogrammed rerouting for 800 calls for use in emergency situations such as downed lines.

■ **Dialed number identification service.** This permits the customer to identify the incoming 800 line in a multiple-trunk service group by forwarding a one- to seven-digit code to the customer facility.

■ **Exchange routing.** This feature permits the customer to designate regions by the Number Plan Area (NPA) or the exchange area codes from which calls may originate.

■ **Referral service.** When customers change carriers, this permits them to route calls to an announcement, which refers the caller to the customer's new 800 number.

■ **Routing control service,** called 800 Configuration Manager by MCI. This permits the customer to change the routing plan on a real-time basis through either CRT or dual-tone multifrequency phone access.

■ **Standard area selection.** This feature permits the customer to choose the service area coverage desired by range or band. For example, Range 3 coverage would cover Service Areas 0, 1, 2 and 3.

■ **Tailored call coverage,** called area code selection by US Sprint. This permits customers to designate regions of area codes from which calls may originate.

It is similar to standard service area selection except that tailored call coverage is capable of defining regions as wide as a band or as small as groups of NPAs.

■ **Time and day routing.** This is provided by day-of-week and time interval routing by MCI and time-of-day and day-of-week routing by US Sprint. Provided by a number of features, this service permits calls to be routed differently according to the time or day the call is placed.

■ **Uniform call distribution.** This permits the user to evenly distribute inbound calls across a service group of 800 lines.

— Daniel Briere

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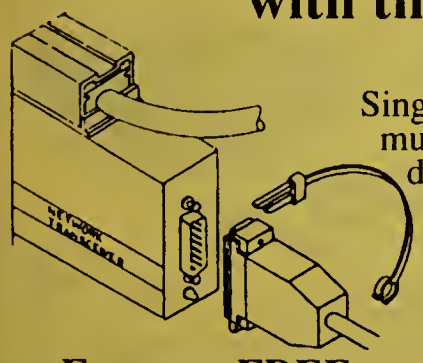

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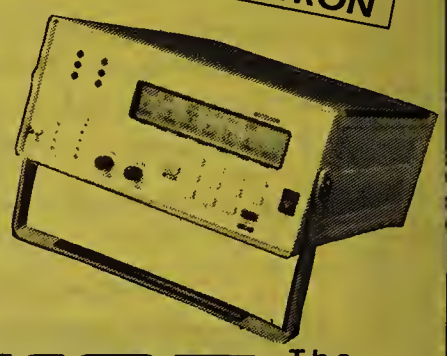

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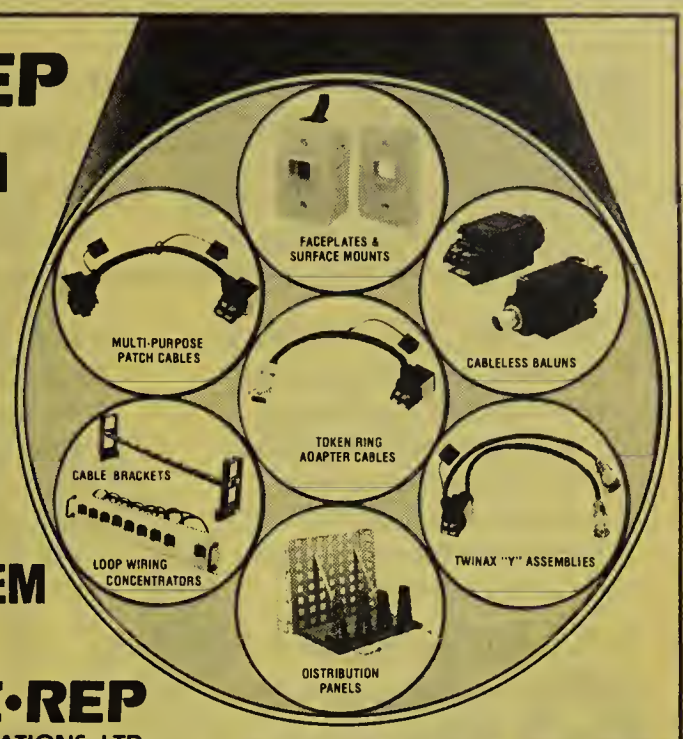

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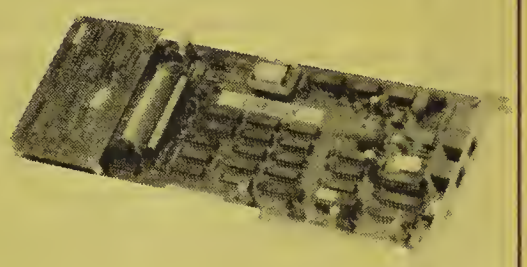

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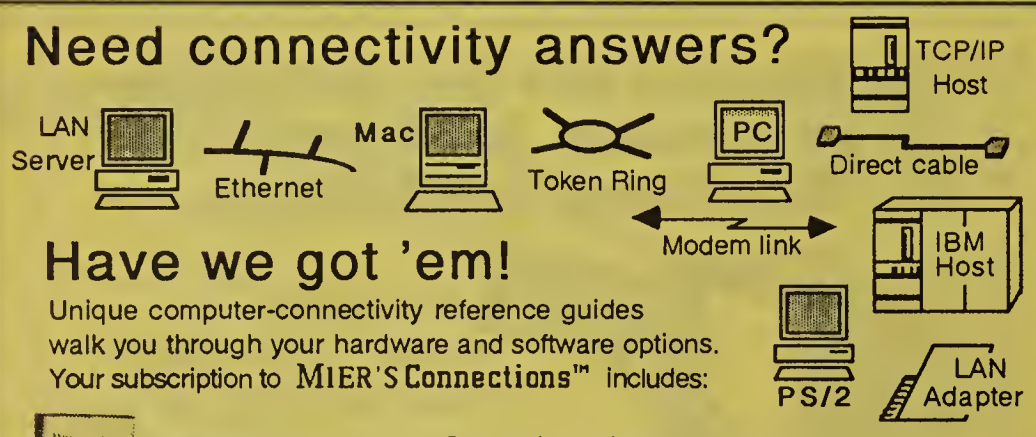

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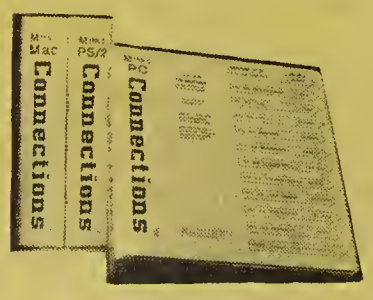

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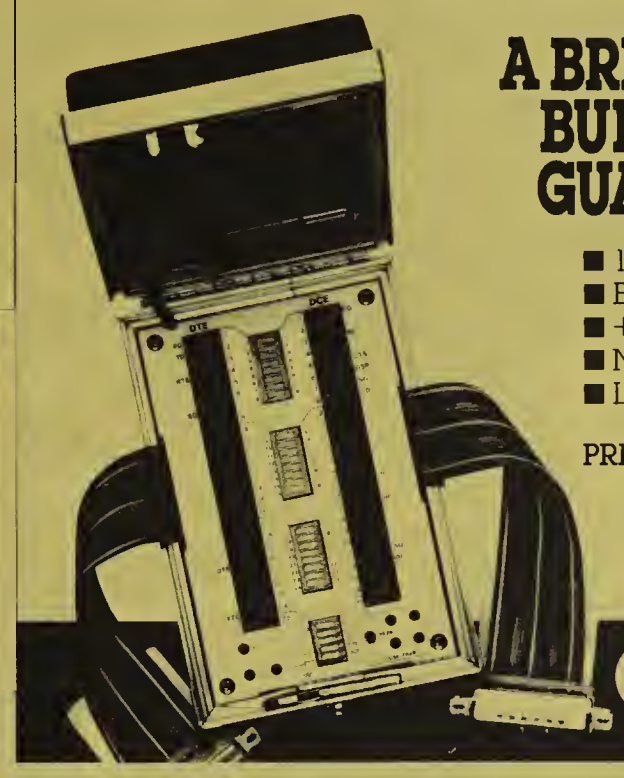

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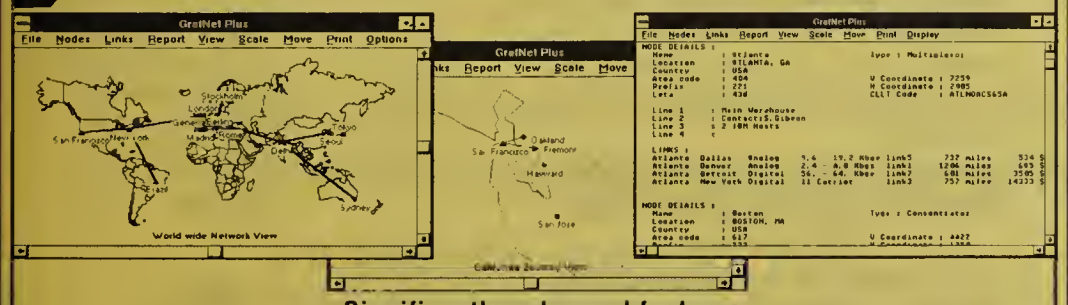

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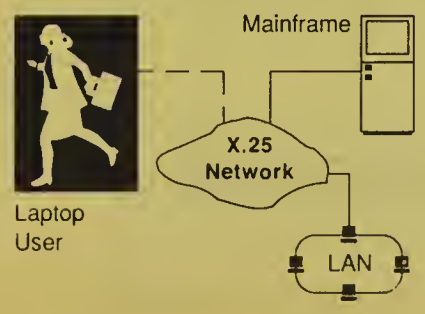

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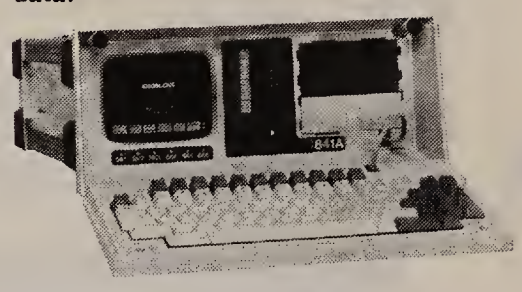

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EICON TECHNOLOGY CORP.... 514-631-2592
StonyBrook Technologies, Inc.. 516-567-6060

Network Management
Communication Devices, Inc..... 800-359-8561
CrossComm 508-481-4060
DIGILOG/CXR 215-628-4530

Storage Devices & Media

Computer Room Equipment
Controller Stacking Frames
Data Connections, Inc..... 919-668-1077

Structured Wiring Systems

Baluns
Anixter.....800-343-5142
RAD Data Communications Inc. . 201-587-8822
The Siemon Company 203-274-2523
Thomas & Betts Corporation....908-685-1600

Wise Components, Inc. 800-543-4333

Cables
Coax
Anixter.....800-343-5142
Wise Components, Inc. 800-543-4333

Fiber Optic
Anixter.....800-343-5142

Siecor Corporation..... 704-327-5189
3M Private Network Products ...800-745-7459
Wise Components, Inc. 800-543-4333

Twisted Pair
Anixter.....800-343-5142
Wise Components, Inc. 800-543-4333

Connectors
Anixter.....800-343-5142
3M Private Network Products ...800-745-7459
Thomas & Betts Corporation....908-685-1600
Wise Components, Inc. 800-543-4333

Cross Connect Blocks
Anixter.....800-343-5142
3M Private Network Products ...800-745-7459
The Siemon Company 203-274-2523

Wiring Concentrators
Anixter.....800-343-5142

Support Equipment

Power Distribution/ Equipment Protection

Secondary
The Siemon Company 203-274-2523

UPS
3M Private Network Products ...800-745-7459

Support Services

Consulting

LAN/Mind, Inc. 800-325-5267
Multi-Tech Communications 201-627-2518
Telco Research Corporation 615-320-6124
XTEND COMMUNICATIONS 212-725-2000

Educational Training Services
Data Communications
Business Communications Rev.708-986-1432
ICA..... 800-422-4636

E-Mail Training
Westcon Training Centers.....800-873-6040

IBM: SAA/SNA
Galaxy Consultants..... 408-354-2997

LAN
Business Communications Rev.708-986-1432
ICA..... 800-422-4636
Westcon Training Centers.....800-873-6040

Novell
LAN/Mind, Inc. 800-325-5267
PTXI.....800-783-PTXI
Westcon Training Centers.....800-873-6040

Telecommunications
Business Communications Rev.708-986-1432
ICA..... 800-422-4636

3COM
PTXI.....800-783-PTXI

Installation Services
GE Network Service 800-726-4327

Solunet, Inc..... 800-828-0151

Lease/Resale Organization
SOURCE Telecommunications..214-450-2700

VSAT Installations

Telecommunications/ Voice

Call Accounting
DIGILOG/CXR 215-628-4530
Telco Research Corporation 615-320-6124
XTEND COMMUNICATIONS.....212-725-2000

Key Systems
SOURCE Telecommunications.... 214-450-2700

Fax Processing Systems

The FAX Group.....619-792-6400
GammaLink.....408-744-1430

ISDN Products
Anixter.....800-343-5142
Hewlett-Packard Company
Colorado Telecomm Div.....719-531-4414

PBXs (under 200 lines)
SOURCE Telecommunications.... 214-450-2700

Microwave Transmitters/Receivers
Motorola Microwave.....800-962-1826
Racon, Inc.....800-426-5245

Voice Response
Syntellect Inc. 602-789-2800

VSAT Customer Premises Equipment
Scientific-Atlanta, Inc.
Private Networks Business 407-255-3000

Transmission Services

Dedicated Lease Line
Communications Transmission. 800-272-9CTI

Facsimile
GammaLink.....408-744-1430

Microwave

Motorola Microwave.....800-962-1826
Racon, Inc..... 800-426-5245

Packet Switching
Dynatech Communications 703-550-0011
StonyBrook Technologies, Inc.. 516-567-6060

VSAT
CSA-VSAT Consultants 408-996-0585
GTE Spacenet Corporation 703-848-1000
Scientific-Atlanta, Inc.
Private Networks Business 407-255-3000

Wide Area Networks

Concentrators
Amnet, Inc. 508-879-6306

Network Switches
Amnet, Inc. 508-879-6306

Industry Briefs

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Members include AI Corp., Ashton-Tate Corp., Banyan Systems, Inc., Cognos Corp., Computer Associates International, Inc., Datamedia Corp., Digital Equipment Corp., Hewlett-Packard Co., Ingres Corp., Integral Systems, Inc., Interleaf, Inc., Lotus Development Corp., MultiView, Inc., Ross Systems, Inc. and Sybase, Inc.

The council said companies should adhere to the ethical guidelines established by the Microcomputer Industry Association, the Business/Professional Advertising Association and the Public Relations Society of America. The council also advised members to adopt the Transaction Processing Performance Council's standards for on-line transaction processing and batch-mode data base performance.

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Metromedia-ITT to expand card

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need not access operators to pay for calls originated abroad with a calling card.

In addition, the Executive Telecard service can be used to pay for calls destined for virtually any location. MCI and US Sprint calling cards can only be used to pay for calls to the U.S.

The same is true of AT&T's calling card, except in a few countries, such as the U.K., where travelers can use "1M" numbers on the AT&T calling cards to pay for calls to destinations other than the U.S. Callers must read the 1M numbers to foreign operators, who then route the calls to their destination ("Carriers' inroads abroad ease use of calling cards," *NW,* Aug. 27).

"I think it's a big advantage for [Metromedia-ITT]," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Montclair, N.J.

Executive Telecard, based in Nyon, Switzerland, introduced its calling card service in the middle of 1989, Holofcener said.

When Executive Telecard introduced the service, Holofcener said it issued its own calling card to enable travelers to make calls; it now has more than 3,000 subscribers. But he added that Executive Telecard's primary market is getting banks, carriers and charge and travel card companies to sign up for the service to expand the functionality of their charge, credit and calling cards.

> Holofcener said several foreign banks and travel companies subscribe to the Executive Telecard service.
>
> ▲▲▲

Holofcener said several foreign banks and travel companies subscribe to the Executive Telecard service but no U.S.-based financial services or travel companies do. He added, however, that this will change within two weeks when Executive Telecard announces its first agreements with U.S. banks that will utilize the service to let customers use their credit cards to pay for calls when traveling abroad.

> Executive Telecard also will run operator-assistance staffs for Metromedia-ITT.
>
> ▲▲▲

Holofcener added that in the coming weeks, Executive Telecard plans to announce calling card agreements with three other second-tier U.S. carriers.

In the Metromedia-ITT implementation, callers will be billed standard foreign carrier rates for all calls placed abroad, plus an as yet undetermined surcharge, said Carolyn Rettberg, a Metromedia-ITT product planner.

Initially, travelers will have to place calls from push-button, tone-emitting telephones to use the automatic verification feature, said George Grabowich, Metromedia-ITT's product manager for shared services. Rettberg admitted that there are relatively few push-button, tone-emitting telephones abroad.

But Grabowich said that soon after Metromedia-ITT rolls out the new international calling card service, which is scheduled for the first quarter of 1991, automatic verification will be supported via rotary telephones.

Executive Telecard will also run operator-assistance staffs for Metromedia-ITT that will verbally verify Metromedia-ITT Preferred Calling Card card numbers used to pay for calls placed from another 32 countries, in addition to the 20 where automatic verification will be available.

Wyse intros X-based terminal

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ers the full processing power of each additional CPU with no degradation, according to the company.

With its single 80486 CPU, the 740 will support a maximum of 64 active users in networked and multiuser environments.

The 740 can be configured with 128K bytes of external cache memory and up to 192M bytes of random-access memory; it has 11 slots on the Wyde and EISA buses. Small Computer System Interface peripherals include a choice of 200M-, 420M- or 660M-byte disk drives, a 525M-byte tape drive and a 1.3G-byte Digital Audio Tape drive.

As with the 5000i and the 9000i series, the 740 will be shipped with AT&T's Unix System V/386 operating system. It will also run XDOS from Hunter Systems and VP/ix from Interactive Systems Corp. and The Santa Cruz Operation, Inc., each of which enables DOS applications to run directly under Unix.

The 740 ranges in price from $17,500 to $31,450 in typical configurations.

Wyse can be reached by writing to 3471 N. First St., San Jose, Calif. 95134, or by calling (408) 473-1200.

Calendar

Oct. 22-26, Nice, France — European Unix systems User Group (EUUG) Technical Conference and Exhibition. Contact: EUUG, Owles Hall, Buntingford, Herts, SG9 9PL; 44-763-73039.

Oct. 24-26, Boston — The Fiber Optic and Computer Networking Exhibition & Conference. Contact: American Electronics Association, 5201 Great America Pkwy., Santa Clara, Calif. 95054; (408) 987-4200.

Oct. 25-26, San Jose, Calif — Local Area Networks. Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015; (201) 478-5400.

Oct. 29-31, Washington, D.C. — Government Communications Conference II. Contact: Corporation for Open Systems, 1750 Old Meadow Road, McLean, Va. 22102; (703) 883-2765.

Oct. 29-Nov. 1, Boston — Electronic Imaging East 90. Contact: Registrar, Electronic Imaging East, 1050 Commonwealth Ave., Boston, Mass. 02215; (800) 223-7126.

Oct. 31-Nov. 2, Washington, D.C. — UNICOM '90 Expo & Conference. Contact: UNICOM '90 Convention Office, Suite 2200, 333 N. Michigan Ave., Chicago, Ill. 60601.

Nov. 4-9, Boston — OPTCON '90. Contact: The International Society for Optical Engineering, P.O. Box 10 Bellingham, Wash. 98227; (206) 676-3290.

Nov. 5-8, New Delhi, India — International Conference on Computer Communication '90. Contact: Conference Secretariat, CMC Limited, A-5 Ring Road, S. Extension Part 1, New Delhi 110 049; 91-11-626807, 618189.

Nov. 12-14, Atlanta — The 17th Annual Computer Security Conference. Contact: Computer Security Institute, 500 Howard St., San Francisco, Calif. 94105; (415) 267-7651.

Nov. 12-16, Las Vegas — Comdex/Fall '90. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194; (617) 449-6600.

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First Name Middle Name Last Name

TITLE .....

COMPANY NAME .....

DIVISION/DEPARTMENT .....

STREET ADDRESS .....

CITY ..... STATE ..... ZIP .....

C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other _____

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other _____

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER _____

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12 ☐ OTHER _____

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ OTHER _____

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ____

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.
B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:
B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	
		LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers
		SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?
B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bil.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will you consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER _____

(continued on next column)

NETWORK WORLD
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Novell intros SNMP pack for centralized LAN control

By Tom Smith
Senior Editor

SAN JOSE, Calif. — Novell, Inc.'s LANalyzer Products Division last week introduced Simple Network Management Protocol (SNMP) software that enables a network manager at a central workstation to monitor and control devices on a local-area net.

Introduced at INTEROP 90 here, Novell's LANtern Services Manager runs on an Intel Corp. 80386 personal computer under Microsoft Corp.'s Microsoft Windows 3.0.

The software provides centralized management of Novell's LANtern network monitors, which are SNMP agents that collect data on activity across an Ethernet LAN. LANtern can acquire data about any device on the Ethernet, regardless of the protocol supported, and pass that data to the LANtern Services Manager workstation.

LANtern Services Manager supports the full suite of SNMP functions, allowing net managers to perform tasks such as requesting and displaying the values of Management Information Base (MIB) variables. MIBs are data bases that define the set of variables, controls and test points within a device to be managed.

The software monitors all LANterns on the network in real time, creating a log of network events. Net managers can use alarms relayed via LANtern and displayed under Microsoft Windows to take corrective action.

LANtern Services Manager requires 2M bytes of memory on an 80386-based personal computer. The software can receive information from multiple LANterns linked over serial communications lines at speeds of up to 38.4K bit/sec or via high-speed LAN internetworks created by bridges or routers.

Marks a shift

LANtern Services Manager marks a shift for Novell, which until now sold LANtern through third-party vendors that bundled it with their own centralized management software. Now, Novell will sell both LANtern and the LANtern Services Manager directly to end users.

Novell's LANalyzer Products Division said the primary factor differentiating its SNMP management station from others is the support for Microsoft Windows 3.0, which will provide users with a friendly, familiar interface as well as the ability to view data on multiple LAN segments or nodes concurrently.

The software costs $4,995 and is expected to be available in January 1991.

Gateways let MHS utilize X.400

continued from page 4

such as Da Vinci Systems Corp. Da Vinci could bundle the product with its MHS software, creating a turnkey system supporting MHS and X.400 messaging.

Retix's MHS to X.400 Gateway for DOS is expected to be available in January 1991. Pricing has not been set.

> Touch's gateway software translates between MHS and X.400 formats.
>
> ▲▲▲

Touch announced a new version of X.400 Gateway for MHS that supports Novell's latest MHS code.

The existing version is based on the MHS code supported by Action Technologies, Inc., which developed MHS but has since sold it to Novell.

Support for the Novell MHS code assures that Touch will offer the latest features of MHS in the most timely fashion, according to Chris Moore, product marketing manager for Touch.

Engine required

Touch's gateway software runs on the MHS server and translates between MHS and X.400 formats. It requires use of the company's existing Worldtalk/400 Gateway Engine, which is X.400 software running on a Unix workstation.

That gateway engine enables the message to be delivered on a local or remote basis over an X.400-compliant net.

As with the Retix product, the Touch gateway allows MHS users to communicate with MHS or other E-mail systems that support X.400 gateways.

Touch will market its product directly to users. It is available now for $2,000.

Users rally around SNMP

continued from page 1

standards will provide net control capabilities SNMP does not.

Michael Fidler, associate director of communications and operations at Ohio State University in Columbus, said he uses SNMP to manage the Ohio Academic Resources Network (OARNET).

During the past year, Fidler said he has seen many more vendors offering working products for SNMP-based network management.

"There's enough competition so that I can pick and choose this time," he said. At last year's INTEROP, only about five vendors had SNMP tools available, Fidler said. By most estimates, there are now between 30 and 40 SNMP-based products available.

"SNMP is doing what we need," Fidler said. "We can collect network performance data [and] alerts, and do some configuration" of the 30-plus routing nodes in OARNET.

Door is open to CMIP/CMIS

But Fidler said he is open to the idea of using CMIP/CMIS and expects to do so as OSI-based systems are rolled out in OARNET or in the college campus network.

CMIP/CMIS is designed to support more complex management functions and data structures, and can handle complicated control tasks with a single command.

However, as SNMP advocates are quick to point out, such capabilities are only on paper at this point. To the staunchest of them, "CMIP spells evil. It even has the same number of letters," said Michael Greenberg, a member of the technical staff at FTP Software, Inc., one of the participants in last week's SNMP demonstration. "If it works, I'll use it. If it doesn't, SNMP does," he said.

But Laurie Bride, manager of network architecture at Boeing Computer Services Co. in Seattle, said the power of OSI net management is the goal everyone should be working toward.

"There's a tremendous amount of energy being wasted," she said. "If we could get the talent and resources focused in a common direction, we'd be moving a lot faster."

Because CMIP/CMIS products will be more powerful than SNMP tools, they will use more memory on managed devices, although how much more is debatable. It's not clear, for example, whether it will be practical to run a CMIP agent on a local-area network concentrator or a LAN bridge.

Some vendors say that will require too much memory, making those devices too expensive. Others say computing power is getting less expensive so memory will not be an issue. And nobody seems to know exactly how much memory will be required.

What does seem clear is that vendors are positioning their management products to support both SNMP and CMIP. Companies such as Advanced Computer Communications, Cabletron Systems, Inc., Digital Equipment Corp., IBM, Hewlett-Packard Co., and Hughes Network Systems, Inc. have said they will take that tack.

DEC, for example, will roll out common agents capable of supporting SNMP, CMIP or DECnet management protocols on a router, said Bill Gassman, telecommunications and networks marketing manager for net management products at DEC.

Among the features CMIP promises beyond what SNMP already provides are security, more sophisticated object modeling and support of more powerful commands.

CMIP supports a complex object modeling technique that lets a user include many attributes of a device in a single object definition, said Larry Marks, president of Distributed Systems Solutions International, Inc., a consulting and systems integration company in Berkeley, Calif. For a 9.6K bit/sec modem, for example, a user could define its various speeds and levels of error correction in a single object definition. With SNMP, those attributes must be defined separately, he said.

CMIP also allows a user to accomplish complex tasks with a single command, Gassman said, whereas SNMP can conduct only one task at a time.

OSI advocates claim they have made strides in the past year, including the adoption of CMIP as a full international standard.

"It's now a stable standard for the first time," said Katherine Jones, senior product marketing manager for communications products at Data General Corp. "CMIP isn't galloping along in terms of the quick acceptance we've seen of SNMP, but it isn't a trivial thing to implement."

Erv Wittman, West Coast manager of programming development for IBM's Communication Products Division, said significant progress has been made in the last year within the OSI/Network Management (OSI/NM) Forum on defining objects, which is the final step before CMIP management products become a reality. He predicted such products would roll out in two to three years.

Marks said he expects the OSI/NM Forum to conduct a CMIP demonstration at the next major trade show at which it exhibits, which will probably be in the beginning of next year.

SNMP wares take spotlight

continued from page 4

Although SNMP products are not new, they are just beginning to overcome an early limitation. SNMP agent software on managed devices was optimized for use with a single vendor's SNMP management station; management stations could not support custom capabilities in the agent software.

That means multivendor management capabilities were limited to basic SNMP functions so users couldn't reap the benefits of vendor-specific extensions to the standard SNMP Management Information Base (MIB), which defines the variables, controls and test points within a device to be managed ("Customization of SNMP products obscures benefits," *NW,* April 23).

If INTEROP was any indication, vendors are taking significant steps toward improving support for multivendor devices.

Cabletron Systems, Inc. unveiled SNMP agent software that enables the company's management stations to manage 3Com Corp. Ethernet adapters in personal computers. The announcement is important because 3Com, the largest supplier of Ethernet boards, does not offer an SNMP agent. The SNMP agent software is priced at $59.

Performance Systems International, Inc. (PSI) announced that the latest release of its SNMP management software supports a proxy SNMP agent that monitors T-1 channel service units (CSU) from Digital Link Corp. This agent reports information about the CSUs, which use a proprietary management protocol, to PSI's Unix-based SNMP management station.

Advanced Computer Communications (ACC) demonstrated for the first time a recently announced upgrade of its ACS 4800 Network Management System.

Version 2.0 of ACS 4800 boasts built-in support for the MIB extensions in 15 vendors' products, according to Gary Krall, director of marketing for ACC.

Perhaps more importantly, ACS 4800 allows users to load other vendors' MIBs into the 4800's SQL data base, giving it the capability to manage virtually any SNMP-compliant product.

ACC's approach will also allow users to adapt to changes in other vendors' MIBs, Krall explained.

Vendors such as Cabletron Systems and Wellfleet have also recently announced support for MIB extensions of multiple third-party vendors.

The SNMP barrage at INTEROP was proof that SNMP has become the protocol of choice among users, according to Timothy Dennison, Unix/LAN administrator in academic computer support at the State University of New York (SUNY) College of Technology at Utica/Rome. Dennison was evaluating SNMP products to manage a 1,000-node Ethernet backbone at the SUNY campus.

"I see vendors moving more toward SNMP because it's easier to implement than CMIP," Dennison said. "And customers are asking for SNMP more than CMIP."

"CMIP? What's that?" asked Kevin White, vice-president of development at the LANalyzer Products Division of Novell, Inc., which last week introduced an SNMP station to work with its LANtern network monitor.

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Vendors demo realities of new frame relay services

Product showcases highlight benefits of services, vendors announce aggressive delivery schedules.

By Paul Desmond
Senior Editor

SAN JOSE, Calif. — Frame relay services took a couple of steps closer to reality last week as vendors demonstrated several benefits of the technology and announced product delivery dates.

StrataCom, Inc., cisco Systems, Inc., Sprint Data Group and Digital Equipment Corp. conducted what they billed as the first major public frame relay demonstration, which included a link to Sprint Data's public electronic mail host in Reston, Va.

In addition, StrataCom and cisco Systems said the frame relay products they have been promising are now available. Proteon, Inc., in its first frame relay announcement, unveiled a frame relay interface for its multiprotocol bridge/router products.

In the frame relay demonstration here, StrataCom exhibited two Transmission Control Protocol/Internet Protocol local-area networks, each linked via a DEC-router to separate StrataCom IPX multiplexers. A T-1 line linked the IPXs, both of which were located in the company's booth.

Brian Button, StrataCom's product line manager, transferred a 27K-byte file between two Apple Computer, Inc. Macintosh workstations — one attached to each of the TCP/IP Ethernet LANs. The transfer was virtually instantaneous and, Button said, it was four to five times faster than it would have been with a more traditional 56K bit/sec link between the DECrouter and the IPX.

Another demonstration showed attendees how customers could use frame relay to feed data to a T-1 backbone from a site where bandwidth requirements do not justify a T-1 multiplexer.

In that scenario, an Apple Macintosh was attached to an IPX via a cisco Systems router outfitted with the frame relay interface. The IPX was linked via a T-1 line supported by channel service units to another cisco Systems IGS bridge/router located in the cisco Systems booth that also supported a Macintosh.

Another phase of the demonstration highlighted a link from Sprint Data's E-mail host in Reston, Va., to a DEC VT-220 terminal attached to a Sprint Data TP4900 packet switch. That switch was attached via a frame relay interface to an IPX in the StrataCom booth, which in turn was linked via a T-1 line to another IPX 40 miles away at a Sprint Data site in Burlingame, Calif.

The Burlingame IPX was outfitted with a frame relay interface to another TP4900 that provided a connection to SprintNet, Sprint Data's public X.25 network, which was used to access the SprintMail host in Reston.

Alan Taffel, vice-president of market development at Sprint Data, was able to access the production E-mail host and retrieve messages almost instantaneously. An X.25 public data network introduces about a 200-msec delay, whereas with frame relay, that delay is reduced to about 20 msec, he said.

Button said the Sprint Data demonstration was a good example of how frame relay can provide performance improvements for existing technologies such as asynchronous terminals and X.25 packet switches.

Cisco Systems said it is now shipping frame relay software for its two-port IGS bridge/router, four-port CGS, eight-port MGS and for the 16- and 32-port AGS and AGS+ bridge/routers.

The software packetizes data according to specifications in the frame relay standard, which includes a 16-bit header containing data for routing and congestion control. It also complies to the implementation plan adopted last month by cisco Systems, DEC, Northern Telecom, Inc. and StrataCom,

The software upgrade for cisco Systems' products ranges in price from $750 for the IGS to $3,200 for the AGS+.

StrataCom's frame relay packet assembler/disassembler card for its IPX FastPacket T-1 multiplexer also complies with the frame relay implementation plans adopted by StrataCom and the other vendors, Button said.

The new PAD works with feeder-type frame relay products, such as the cisco Systems routers. It accepts frame relay frames and segments them into 24-byte cells that can be shipped across StrataCom's proprietary fast packet T-1 backbone nets.

Each PAD consists of a V.35 interface with four ports and costs $12,500. StrataCom's new Release 5.1 software, which runs across the company's IPX multiplexer line, is also required to support frame relay. That software is available as a $1,500 upgrade to Release 4 IPX users.

Proteon said it will provide a frame relay interface for its p4100+ Bridging Router. The company expects to test the interface with DEC and Sprint Data products in the first quarter of 1991 and to ship the interface in the third quarter of next year. Company President and Chief Executive Officer Patrick Courtin said pricing for the products has not been set.

Vendors take fast track

continued from page 1

their differences aside to form joint product development alliances and many are backing an interim joint frame relay specification in an effort to ensure interoperability of products delivered before ANSI or Consultative Committee on International Telephony and Telegraphy standards are finalized.

"The frame relay market is developing at lightning speed," said Nick Lippis, a principal with Northeast Consulting Resources, Inc. in Boston. "It's amazing how soon the vendors have started announcing delivery dates."

Frame relay technology, an evolutionary step beyond X.25, is expected to improve packet network efficiency and let users more efficiently accommodate emerging applications such as wide-area interconnection of high-speed local-area networks.

Teaming up

Recognizing the need to offer interoperable products, cisco Systems, Inc., Digital Equipment Corp., Northern Telecom, Inc. and StrataCom, Inc. jointly developed a frame relay specification on which product development can be based in lieu of a finalized official frame relay standard.

At press time, 18 other vendors committed to supporting the specification, which is based on the emerging ANSI standard but has additional management features.

These vendors include Newbridge Networks, Inc., Telematics International, Inc., 3Com Corp., Timeplex, Inc. and Vitalink Communications Corp.

"By forming strategic alliances and supporting the new specification, vendors figure that they'll be able to get frame relay products to market quickly, get that business and then have the development dollars left to get working on" future technologies such as cell relay, said LuVa Zoppe, product marketing manager at Telematics.

> "Bridges and routers are based on packet architectures. That makes supporting frame relay pretty easy for them."
>
> ▲▲▲

Telematics, a maker of packet switches, has teamed with a small Australian equipment vendor to deliver frame relay support early next year, she said.

For some vendors, such as those that offer internetwork products, adding frame relay support typically requires a fairly simple software upgrade, analysts said.

Easy support

"Bridges and routers are based on packet architectures," said Joe Gottlieb, a manager at Network Strategies, a Fairfax, Va., network consulting practice of Ernst & Young. "That makes supporting frame relay pretty easy for them."

This explains why so many bridge and router vendors are among the first to announce frame relay support, he said.

Much of the challenge for internetwork vendors has come while working to develop interoperable products with T-1 multiplexer vendors, a task they have embarked on in the belief that frame relay will probably be initially implemented on T-1 backbones.

Cisco Systems worked with T-1 multiplexer maker StrataCom for 18 months before announcing frame relay support on its router/bridges last week. Newbridge Networks and Wellfleet Communications, Inc. are also working on frame relay products.

T-1 multiplexer vendors

Industry watchers said vendors of T-1 multiplexers based on proprietary time-division multiplexer (TDM) architectures face the most challenging transition

Vendors supporting frame relay

Vendors	Products	Introduction date	Cooperative efforts
Advanced Computer Communications (ACC)	All routers	4Q 1990	British Telecommunications PLC, Northern Telecom
AT&T	IACSA Wide Band Packet Switch	Now	Unknown
	BNS 2000	2Q 1991	Unknown
BBN Communications Corp.	T/200 Router, all packet switches	3Q 1991	Unknown
cisco Systems, Inc.	All routers	4Q 1990	DEC, Northern Telecom, StrataCom
Digital Equipment Corp.	Routers	3Q-4Q 1990	cisco Systems, Northern Telecom, StrataCom, Vitalink
Hughes Network Systems, Inc.	Integrated Packet Network	2Q 1991	Unknown
Netrix Corp.	#1-ISS	1Q 1991	Northern Telecom
Newbridge Networks, Inc.	MainStreet 3600, 3645	1Q 1991	Wellfleet
Northern Telecom, Inc.	DataSpan	Now	ACC, cisco Systems, DEC, Netrix, Northern Telecom, StrataCom, Vitalink
Proteon, Inc.	All routers	3Q 1991	StrataCom, US Sprint
RAD Network Devices, Inc.	Bridges, routers	3Q 1991	Unknown
StrataCom, Inc.	All IPXs	Now	cisco Systems, DEC, Proteon, Vitalink
Telematics International, Inc.	Frame Relay Exchange	3Q-4Q 1990	Network Automation
3Com Corp.	NETBuilder router	2Q 1991	Unknown
Timeplex, Inc.	Link multiplexers	3Q 1991	Unknown
US Sprint Communications Co.	TP7900, TP4900	3Q 1991	Northern Telecom, Proteon, StrataCom, Wellfleet
Vitalink Communications Corp.	All bridge/routers	1Q 1991	DEC, Northern Telecom, StrataCom, US Sprint
Wellfleet Communications, Inc.	All routers	1Q 1991	Newbridge, US Sprint

IACSA = Integrated Access Controller System Architecture

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: NORTHEAST CONSULTING RESOURCES, INC., BOSTON

to frame relay because they have little experience with packet-switching technology.

Mary Modahl, an analyst with Forrester Research, Inc., a consulting firm in Cambridge, Mass., that just published a report about frame relay's affect on users, said vendors of TDM-based T-1 equipment will need to add a packet engine to support frame relay. There are two ways to do this.

One way would be to offer frame relay modules, or boards, for existing circuit-switched machines, Modhal explained. Another way would be to use a front-end frame relay switch developed by a business partner.

Joy Pinsky, director of program management for T-1 multiplexer maker Network Equipment Technologies, Inc., said her company is still in the planning stages with frame relay but is looking at devising a frame relay interface to fit into its Integrated Digital Network Exchange multiplexers.

"The majority of network services today are circuit-switched so we'll support both circuit- and packet-switched traffic," Pinsky said. "We're moving toward a hybrid switch that would let users support both types of traffic."

In the long term, some T-1 equipment vendors may be forced to revamp their architectures to incorporate packet-switching capabilities, said Rosemary Cochran, a principal at Vertical Systems Group, a Dedham, Mass., market research firm.

With interim solutions, T-1 multiplexer vendors will have to allocate a defined amount of bandwidth for frame relay support, which somewhat defeats the purpose of enabling users to optimize total bandwidth on their nets, Cochran said.

One vendor that won't need an interim solution, observers agreed, is StrataCom, the Campbell, Calif., maker of the IPX fast packet multiplexer.

StrataCom's switches were made with frame relay in mind, given that they incorporate fast packet technology, according to Bill Stensrud, StrataCom's vice-president of marketing.

StrataCom last week announced a software upgrade that will enable IPX users to support frame relay.

Netrix Corp. will also have an edge in supporting frame relay, given its experience with packet-switching technology, analysts said.

Netrix's switch is a hybrid circuit/packet switch.

Packet-switch makers are also well-suited to support frame relay, but they need to upgrade their switches to support higher speed links in order to support bursty applications such as LAN interconnection, Modahl said.

Telematics, for one, is upgrading the speed supported by its packet switches from 236K to 2M bit/sec, Zoppe said.

Firm swaps host for AS/400 net

continued from page 1

ating centrally, while the organization operated in a decentralized manner."

The change will also dramatically improve communications among the many far-flung units of the company and will lay the groundwork for cooperative application processing.

Fluor Daniel is the principal subsidiary of Fluor Corp., a $6 billion holding company.

The leading engineering/construction firm in the U.S. based on the value of its contracts, Fluor Daniel designs and builds industrial facilities such as petrochemical plants, refineries and prisons.

The firm currently runs an international network serving 56 sites in Australia, Canada, Europe, the Middle East and the U.S.

The U.S. sites are linked to the data center here, which houses an IBM 3084 mainframe using T-1 and fractional T-1 lines carrying voice and data. Some domestic sites access the data center through a hub in Greenville, S.C. International sites are linked to the center using 9.6K, 56K and 64K bit/sec lines.

The company uses Timeplex, Inc. Timepac packet-switching equipment, which packetizes IBM Systems Network Architecture data in X.25 format for transmission over the network.

Roughly two years ago, Fluor Daniel commissioned Dave Phillips, who at that time was running his own consulting company, to study its network operations. Phillips, now Fluor Daniel's vice-president of information technology, began with a "critical success factor" survey, in which Fluor Daniel's top executives

identified requirements for making the company successful.

Responses included "effectively sharing work between offices worldwide" and "making a quantum leap ahead in internal communications."

"We tried to have the business units tell us what's critical to their success, ignoring technology," Phillips recalled.

Strategic plan

Based on these factors, a strategic IS plan was drafted. Its goals included migration to a distributed computing environment and movement of processing close to users — both of which were seen as necessary to supporting the distributed, project-oriented work carried out by employees.

The company decided to let applications drive the selection process. "The application selection procedure defined the hardware platform," Phillips said. "We didn't select the platform first and then the package that ran on it."

The company sought single accounting and human resources/payroll packages to replace multiple systems currently running on the mainframe. It also sought systems that could be used in distributed processing.

For example, it decided to implement an AS/400-based accounting system made by The McCosker Corp. of San Ramone, Calif., to replace two host-based accounting systems that were developed in-house. In addition, Fluor Daniel decided to use Cyborg Systems, Inc.'s Solution Series Human Resources and Solution Series Payroll to replace multiple homegrown systems. Both products run on several platforms, including AS/400s.

Under the distributed architecture, users will be able to handle local processing and upload summary information to its headquarters. All application processing currently takes place on the mainframe. In addition, the distributed network will support electronic mail and communications among computer-aided design systems.

The net will use IBM's APPN, which supports mainframeless, peer-to-peer networking under SNA with dynamic multipath routing. The AS/400s will be linked using the wide-area facilities used today.

Fluor Daniel will continue to run other applications, including CAD systems, on DECnet-based Digital Equipment Corp. VAXes that have gateway access to the IBM host.

Phillips said the AS/400 is priced competitively with DEC VAXes. "We certainly like VAXes, and we have a number of them," Phillips said, "but this [decision] was application-driven."

The AS/400s will continue to support the mix of IBM terminals and personal computers on Ethernet LANs in Fluor Daniel's offices. The built-in Ethernet support IBM added to the AS/400 in August makes the machine even more attractive, O'Connor said ("IBM broadens net options for AS/400," *NW*, Aug. 27).

A single AS/400 is currently in operation here, while another has been installed in Calgary, Canada. The company will eventually install three AS/400s here to replace the IBM mainframe, and beginning in late 1991 or early 1992, will start to distribute AS/400s throughout its sites.

Migration to the AS/400 net could cost as much as $20 million. Phillips said he expects to realize some cost savings but declined to detail specifics.

"Fluor Daniel is already well-known for its excellent project execution," Phillips said. "We're trying to make the technology supportive of that."

GE forges DEC/IBM link

contnued from page 2

homegrown engineering change order (ECO) system that runs on a DEC VAX 8810 processor here.

The VAX 8810 is attached to a DECnet local-area network that also supports a VAX 3600 and VAX 11/785 running mechanical design software that serves roughly 30 VAXstations used by EDC's designers.

With EDISON, engineers can alter design files in one on-screen window and document the changes on an electronic ECO in another window, according to Odoy.

Previously, designers had to log changes manually onto ECO forms, which were then sent to clerks who keyed the data into a terminal attached to the division's Application System/400, which runs IBM's Manufacturing and Production Inventory Control System (MAPICS) software.

The MAPICS product is used to generate a central repository of all products, their components and changes made to them. Data base updates — listing all products, associated parts and ECOs — are periodically downloaded to factory hosts.

To tie together the MAPICS and EDISON applications, EDC installed Systems Strategies, Inc.'s ezBRIDGE Peer-to-Peer software that supports IBM's LU 6.2 peer networking protocols.

The ezBridge software acts as a gateway that enables EDC's engineers to send design changes in real time to MAPICS, eliminating the need for clerks to key the ECOs into the division's AS/400.

The software also enables EDISON to download accurate and up-to-date design data stored on MAPICS — such as part and group numbers — and insert it directly into ECOs being filled out by engineers. This eliminates errors, such as invalid part numbers or product descriptions, which could delay the implementation of an ECO, Odoy said.

The software consists of both client and server modules. The client portion resides on the VAX 8810 processor, which also supports EDISON. When an engineer opens up a new ECO within EDISON and inputs a part number, for instance, the client portion of the ezBRIDGE software requests a link to the AS/400.

The server module runs on a DEC MicroVAX, which acts as a server for the DECnet to access other environments. This server is linked to the division's AS/400 via a serial line. It receives data requests from the client software and establishes an LU 6.2 session with MAPICS.

Odoy said the EDISON-to-MAPICS link is the first of several engineering and production applications that EDC is hoping to tie together in the near future using the LU 6.2 gateway.

"We're still a long way from taking full advantage of the link between engineering and production," Odoy said. "But at least we've overcome the biggest hurdle, which is interconnecting two shops that traditionally have operated quite independently."

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SITA overhauls net to handle growth

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Systems Network Architecture to support advanced applications. X.25, for example, can route multiprotocol traffic.

Nonprofit SITA provides data communications and processing services to member airlines in 184 countries. The SITA network supports on-line terminal-to-host and host-to-host traffic. SITA members use the net to book flights and rely on SITA services to support sites where they cannot cost-justify installing dedicated facilities.

According to Michel Roujansky, SITA's deputy director of projects and leader of the MTN project, the Northern Telecom packet switches will support higher transmission speeds and enable the group to meet the growing call for X.25. They will also support more lines than the Unisys front-end processors.

MTN will have a two-tiered architecture, Roujansky said. Remote terminals or microcomputers will transmit X.25, asynchronous or SNA data to one of as many as 300 X.25 concentrators at speeds up to 9.6K bit/sec. The concentrators will convert asynchronous and SNA data to X.25 and forward it to a 20-node backbone network of DPNs via dedicated links supporting speeds of up to T-1 or E-1, T-1's 2.048 bit/sec counterpart in Europe.

The backbone will initially switch between 3,000 and 6,000 packet/sec, but it has the potential of switching 30,000 packet/sec. The initial four nodes will be installed in London, Los Angeles, New York and Paris early next year. All 20 nodes are scheduled to be up by 1992.

SITA has already installed Telematics International, Inc. packet switches at 30 concentrator sites. SITA is committed by contract to install several more Telematics switches, but Roujansky declined to say how many. He said SITA will eventually replace the Telematics switches with DPNs.

Under the current Advanced Network setup, airline terminals forward traffic at speeds of up to 9.6K bit/sec to a customized SITA concentrator based on hardware from Westinghouse Canada, Inc. That concentrator routes traffic via dedicated circuits at up to 56K bit/sec directly to a Unisys DCP or a Timeplex, Inc. T-1 multiplexer that forwards data to the DCP. The DCP routes the data to the target host.

The Advanced Network will remain in place while SITA migrates to MTN, Roujansky said. SITA will even build proprietary gateway software to route traffic between the X.25 switches and the DCPs. This will enable the X.25 switches to forward data to the nearest backbone node, whether it be a DPN or a Unisys front-end processor. It will also enable SITA to use packet switches as they are installed, rather than having to wait for the entire network to be upgraded.

To accommodate airlines that will continue to support ALC and other airline protocols, SITA will develop software that will enable the Westinghouse Canada hardware to act as a packet assembler/disassembler. Doing this enables SITA to convert airline-specific protocols to X.25, rather than adding support for airline-specific protocols to the packet switches.

Roujansky said SITA is already studying plans to further improve its network. For instance, he said, SITA next year will test frame relay technology, which promises to route data through packet networks faster than X.25.

He declined to say which vendors will take part in the test, however.

Trade board selects UB's smart hubs

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According to Glen Belden, the Board of Trade's vice-president for information systems, it would be impossible to cut over any of them without first installing the Access/One net.

"In effect, we're putting in electronic roads and sewers that we'll need [in order] to grow in the future," Belden said.

Backbone configuration

Eight Access/Ones in the data center will be used to interface the Tandems to fiber cables that run down five flights to another eight hubs located near the two trading floors.

Volkswagen builds VSAT net for dealers

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ferent manufacturers' cars will give Volkswagen an advantage, he said.

In addition to providing access to a carmaker's host, the network enables V-Crest to offer dealers a mix of services it was unable to provide in the past, Smith said.

For instance, V-Crest can offer dealers access to various credit card and check authorization networks in order to speed authorization of parts and service payments.

The network's video support will enable dealers to receive training and other business videos from different carmakers.

The VSAT network is designed to transmit X.25 data. Each dealership is outfitted with a four-port device that converts asynchronous, IBM Systems Network Architecture or other data received from local data terminal equipment to X.25 format. The VSAT bounces that data off a satellite at 56K bit/sec to a hub here.

The hub then passes the data to a Scientific-Atlanta X.25 packet switch, which converts it back to its native protocol and routes it to the appropriate host over a leased line. Alternatively, the switch will route X.25 data to a target host that is running X.25 software.

The net is now installed at 250 Volkswagen and Audi dealerships. It should be completed by the end of January.

Unshielded twisted-pair wiring using Ungermann-Bass' implementation of the 10BaseT Ethernet standard will link these eight hubs to 59 other Access/Ones scattered around the perimeters of the trading floors.

Unshielded twisted-pair links will run from the 59 Access/Ones to personal computers, terminals and printers adjacent to the trading floors.

Greg Parcell, the Board of Trade's supervisor of staff support systems, said the exchange began pulling cable for the network in September and plans to finish installing it by May of next year. He said the fiber components of the network may eventually be upgraded to support the 100M bit/sec Fiber Distributed Data Interface standard.

The Board of Trade chose the Access/One hubs because they support fast and efficient links to Tandem hosts, Parcell said. Ungermann-Bass was acquired by Tandem in 1988.

First user

According to Bob Jordan, Ungermann-Bass' director of product marketing, the Board of Trade will be the first user of new Ungermann-Bass software that lets personal computers emulate Tandem 6530 terminals to communicate with Tandem hosts over TCP/IP links.

Without this software, the only way to connect non-Tandem devices to Tandem hosts over an Ungermann-Bass local-area net is to use less efficient means, such as asynchronous protocols, X.25 or a personal computer gateway that Tandem calls the MultiLAN Access Device.

Strategic applications

One of the most important applications that will run over the Access/One net is Audit.

Audit, scheduled to bow in 1992, will consist of custom hand-held devices that traders will use to record trades and communicate them, using spread-spectrum or infrared technology, to custom personal computers adjacent to trading floors.

These computers will relay records of trades via the Access/One net to the Tandem hosts. Belden said Audit will improve the Board of Trade's ability to track trades, which is vital, given recent allegations of trading improprieties.

Software AG airs client/server strategy

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road map to get to that point in two years."

Although some of Software AG's products already support a client/server architecture, the Entire strategy lays out goals for migrating most the rest of its products.

Under the strategy, the company will separate its applications into client and server components. Both components will be able to run on the same machine, such as a host, or be split up and run separately.

Currently, the company offers applications for IBM's MVS, VSE and VM, Digital Equipment Corp.'s VMS and Wang Laboratories, Inc.'s Wang VS operating system environments.

It will issue new versions of existing products for Unix and IBM's OS/2.

Software AG defines clients as any software that issues requests to a server, although they are typically applications, said Jim O'Leary, director of product strategies.

Servers are essentially shared programs that perform functions for multiple users. They accept client requests, process them and pass back the response.

With Entire, Software AG's servers will fall into three categories: SQL servers supporting the SQL standard, extended DBMS servers for non-SQL-based data base management systems and function servers for a range of other complex processing tasks.

Products announced in these categories, respectively, included:

- Entire SQL Server, which is set for delivery in the first half of 1991 as the company's first standards-based SQL server. The company also announced plans to provide the Entire Open SQL Server, a product that will be able to field client requests and reissue them to third-party SQL servers in the appropriate dialect.
- Natural Geographic, an extended DBMS server due out in the first half of 1991 that implements geographic data base requests that involve coordinate-based geographic data and allow the data to be related to other business data.
- The Open Function Server, Open Print Server, Active Object Server, Asynchronous Transaction Server and EDI Communications Server, which are general-purpose servers that Software AG does not currently support. Their ship dates will be announced in the spring.

The company said it would use its Open Communications Agent for communications between clients and servers implemented on different machines.

The agent provides a basic transport service between clients and servers by layering an upper level protocol above protocols in the following: IBM's Systems Network Architecture, DEC's DECnet, Novell Inc.'s NetWare, Banyan Systems, Inc.'s VINES, Microsoft Corp.'s LAN Manager, the Transmission Control Protocol/Internet Protocol and IBM's Communications Manager.

The agent also supports a higher level service for connection-oriented applications that need to interact as peers. This service implements a high-level interface and consists of a small set of verbs that programs use to communicate.

During the first half of next year, Software AG will release two new software products with an open communications agent. The first, NET-WORK for OS/2, will support the basic transport service, and NET-WORK APPC will support peer-to-peer communications.

"Every new construction site, no matter how remote, can become part of our network. All we do is set up a PC and dial in."

"Only BANYAN could have done it."

From an interview with John Good of The Turner Corporation.

"Our New York headquarters is connected to most of our U.S. offices by VINES,® with our job sites on VINES PC Dial-in.

"This allows us corporate-wide access to critical information such as cost control, job progress, and subcontractor monitoring on all current projects. And when someone accesses information, it's up to the minute because of local updating."

How has VINES changed your business?

"Five years ago, everything was on an IBM mainframe. Now the only thing left on it is Human Resources, Benefits, and Payroll. All of our strategic applications reside on VINES. And by the end of first quarter 1991, we'll be off the mainframe entirely."

How did you learn about Banyan?

"I was researching a network at a reference account in Washington. But it lacked many of the features I felt we needed. I mentioned this to their network administrator. He sighed, and said, "These are the people you should talk to. I wish we had." Then he went to his desk and got me a Banyan brochure."

Banyan's VINES network operating software offers unmatched flexibility to accommodate your unique business needs. For a further description of The Turner Corporation's networking challenges and solutions, write or call us at 800-828-2404 (in MA 508-836-2828).

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See The FAXNeT Form on Page 51